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ABSTRACT

The cost of training, as conducted by the Air Force Academy, Reserve Officer Training Corps, and Officer Training School, and leading to the commissioning of new Air Force officers is presented. The student flows, personnel resources required to support the flows, and costs of pilot candidates graduating from each of the three commissioning sources were analyzed. These analyses were made to develop estimating relationships and predictive factors that may be used for estimating pilot candidate costs over a range of commissioned officer production. The analysis for each training program involved is comprised of the following: (1) the study of flow factors; (2) the calculation of average attrition rates; (3) the identification of student load capacities; (4) the determination of historical costs of training at past student-load levels; and (5) the estimation of future costs of training at varying production levels, with costs adjusted to FY 1968 dollars and to take into account estimates of future attrition rates. For related documents, see AC 010 340-341 and AC 010 343-347. (Author/DB)

MEMORANDUM
RM-6082-PR
DECEMBER 1969

THE PILOT TRAINING STUDY: Precommissioning Training

J. W. Cook

PREPARED FOR:
UNITED STATES AIR FORCE PROJECT RAND

The RAND Corporation
SANTA MONICA • CALIFORNIA

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This study is presented as a competent treatment of the subject worthy of publication. The Rand Corporation vouches for the quality of the research, without necessarily endorsing the opinions and conclusions of the authors.

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PREFACE

In April 1967, the Office of the Assistant Secretary of Defense (Manpower and Reserve Affairs) formed a Pilot Advisory Committee to study "Pilots as a National Resource." The Committee consisted of the Assistant Secretary and a representative of each of the three Services. Staff members from Rand were invited to attend the early meetings of the Committee. The outgrowth was that the Air Force member requested Rand to accept responsibility for examining the Air Force pilot training process. The objective of the Rand Pilot Training Study was to develop a series of computer models for use in estimating the resources required to produce pilots and the costs of training them. Further, the models were to be designed for sensitivity analyses and long-range planning.

For the convenience of readers whose interests may not extend to all aspects of the pilot training process, the results of the study are presented in eight volumes, as follows:

Volume		
I	RM-6080-PR	The Pilot Training Study: Personnel Flow and the PILOT Model, by W. E. Mooz.
II	RM-6081-PR	The Pilot Training Study: A User's Guide to the PILOT Computer Model, by Lois Littleton.
III	RM-6082-PR	The Pilot Training Study: Precommissioning Training, by J. W. Cook.
IV	RM-6083-PR	The Pilot Training Study: A Cost-Estimating Model for Undergraduate Pilot Training, by S. L. Allison.
V	RM-6084-PR	The Pilot Training Study: A User's Guide to the Undergraduate Pilot Training Computer Cost Model, by Lois Littleton.
VI	RM-6085-PR	The Pilot Training Study: Advanced Pilot Training, by P. J. Kennedy.
VII	RM-6086-PR	The Pilot Training Study: A Cost-Estimating Model for Advanced Pilot Training, by L. E. Knollmeyer.
VIII	RM-6087-PR	The Pilot Training Study: A User's Guide to the Advanced Pilot Training Computer Cost Model (APT), by H. E. Boren, Jr.

The present Memorandum, Volume III of the series, presents the findings of the part of the study concerned with precommissioning training. Since only commissioned officers are admitted to pilot training, the purpose of this Volume is to document the methodology for estimating the costs of the precommissioning phase. It develops equations for estimating the costs of training, leading to the commissioning of all new Air Force Officers and, more particularly, the costs associated with those who enter Undergraduate Pilot Training (UPT).

It is suggested that Volume I of the series be read by those who desire a comprehensive understanding of the part that precommissioning training plays in the total process of training USAF pilots.

SUMMARY

This Memorandum presents the cost of training as conducted by the Air Force Academy (AFA), Reserve Officer Training Corps (ROTC) and Officer Training School (OTS) and leading to the commissioning of new Air Force officers. These three training programs provide approximately 80 percent of the officers who qualify for entry into the Air Force Undergraduate Pilot Training (UPT) program.* It is with their training costs that this Memorandum is primarily concerned.

The number of enrollees (annual input) required by each of these officer-producing sources is a function of the number of graduates that is required of them and of their respective student-attrition rates. This applies both to the total number of enrollees and to the percentage that are admitted as pilot candidates.

In turn, the pilot-candidate production (UPT input) quota assigned to each source is largely determined by the UPT production (output) requirement and by the rates of attrition experienced during UPT training. Attrition rates differ according to source. The lowest rate occurs among Air Force Academy graduates and the highest among Officer Training School graduates and among the nominal 15 percent of ROTC graduates who do not receive preliminary flight instruction.

The student flows, personnel resources required to support the flows, and costs of pilot candidates graduating from each of the three commissioning sources were analyzed. These analyses were made to develop estimating relationships and predictive factors that may be used for estimating pilot candidate costs over a range of commissioned officer production. The analysis for each UPT source involved is as follows:

*In FY 1969, approximately 7 percent of those entering UPT were Air Force officers already on active duty. Four percent were from the Air National Guard, 3 percent from the Marine Corps, and 3 percent from MAP countries.

- o The study of flow factors, that is, the number of students who entered training in each of the past several years and the number who graduated versus the number who did not.
- o The calculation of average attrition rates.
- o The identification of student load capacities.
- o The determination of historical costs of training at past student-load levels.
- o The estimation of future costs of training at varying production levels, with costs adjusted to FY 1968 dollars and adjusted to take into account estimates of future attrition rates.

Student flows and the cost* of pilot candidate production at each UPT source are summarized as follows:

The Air Force Academy is in the middle of an expansion program. The output of graduates in fiscal years 1966, 1967, 1968, and 1969 was 469, 524, 612, and 679, respectively. Production is scheduled to be increased progressively each year until FY 1973 when it will level off at approximately 920 graduates.

Pilot candidates comprise about 70 percent of the AFA graduates on the average and receive extra training through the Pilot Instruction Program--a program of flight-plane flying instruction. By FY 1973, approximately 645 of the 920 graduates will enter UPT and will cost about $37.8 million in 1968 dollars, including the cost of a Pilot Indoctrination Program.

The ROTC program has been geared to produce about 4500 graduates each year beginning in FY 1969, of whom approximately 35-36 percent will be pilot candidates. Annual program cost of producing 1600 pilot candidates will approximate $12.5 million in 1968 dollars. This includes the cost of a Flight Instruction Program for ROTC pilot candidates.

In FY 1968, 1921 pilot candidates were produced from 6320 graduates at a computed cost of approximately $7.8 million. The quota for OTS pilot candidates will vary, however, as the short-term need of the Air Force changes. Because the number of pilot candidates is not consistently

*To include the cost of graduation, commissioning and travel to a UPT base. See footnote, p. 3.

related to the number of graduates, the size of the FY 1973 program cannot be predicted.

The marginal cost of producing additional officers as pilot candidates is estimated to be $28,550 from the Air Force Academy, $3700 from ROTC, and $2700 from OTS. Officers who are not pilot candidates do not take certain flying training indoctrination courses offered by AFA and ROTC and, consequently, the cost of producing these officers is somewhat lower. The original cost for these officers is estimated to be about $28,000 for AFA and $3000 for ROTC.

Finally, this document focuses on the cost of producing a UPT enrollee, but also deals with the costs of those who are not pilot candidates. The information presented may, therefore, be of interest to those who want only information about the officer-commissioning process and its costs.

CONTENTS

I. INTRODUCTION

PURPOSE OF PRECOMMISSIONING TRAINING

Precommissioning training (PCT) is geared to meet all officer procurement needs of the Air Force. Its purpose is to provide instruction, experience and motivation so that the trainee, upon graduation and commissioning, will have the military skills and the knowledge and qualities of leadership required for his progressive development as a career Air Force officer.

Those who successfully complete commissioning training go into flying training to qualify as pilots or navigators, enter technical training courses or are assigned directly to active duty jobs.

Since only commissioned officers are accepted for pilot training, the precommissioning training is an indispensible part of the pilot production process.

The Air Force need for pilots, for both fixed- and rotary-wing aircraft, is a major driving force for production of commissioned officers, but it is not the only one. Newly commissioned officers are also required for the other rated specialties* and for the multiplicity of nonrated occupational fields (supply, maintenance, administration, etc.) that comprise more than one-half of the total Air Force officer strength.

UNDERGRADUATE PILOT TRAINING

Some pilot candidates receive preliminary flight instruction during precommissioning training, but the basic qualification training of new pilots begins with the 53-week Undergraduate Pilot Training Program (UPT). This program is conducted by the Air Training Command at 10 bases. UPT academic instruction covers engineering, safety, principles of flight, weather, survival, weapons and navigation. Flight training is divided into three phases: preflight, primary and basic. The first 30 hours of primary training is given by civilian contract

*For example, navigators, navigator-bombadiers, radar-intercept officers, reconnaissance system officers, and electronic warfare officers.

instructors in the Cessna T-41A; the remaining 90 hours by Air Force pilot instructors in the Cessna T-37B. The basic flight instruction, also by Air Force pilot instructors, consists of 120 hours in the Northrop T-38 twin jet aircraft. Thus, UPT provides flight instruction in aircraft with speeds ranging from 138 to 800 miles per hour.

In addition to being a commissioned officer, an applicant for pilot (or other rated specialty) training must be not less than 20-1/2 or more than 26-1/2 years of age (and not more than 27-1/2 when he actually enters training); he must meet physical qualifications, without waiver, and must have scored well on the Air Force Officer Qualification Test (AFOQT).

SOURCES OF PILOT TRAINEES

There are three principal sources for the UPT program--the Air Force Academy (AFA), Reserve Officer Training Corps (ROTC), and Officer Training School (OTS). This Memorandum examines for each of these officer-producing sources, the student flows, resources required, and costs incurred up to entrance into UPT.

Additional sources are Air Force officers already on active duty either in "other rated" (other than pilot, e.g., navigator) specialties, or in "nonrated" (e.g., civil engineer) assignments; Air National Guard; Marines; and MAP. The three latter sources provide students for UPT but do not add to the pilot strength of the Air Force. UPT also receives a few Military and Naval Academy graduates.

FACTORS AFFECTING UNDERGRADUATE PILOT TRAINING

The following interrelated considerations are important in the overall study.

1. Number of pilots needed to achieve a balanced (rated and nonrated) officer force of the size required for national security and fulfillment of U.S. policy commitments.
2. Different lead times required for officer production by each officer-training source.
3. Maximum production capacity of each source.

4. Cost per graduate, by training source, and changes in incremental costs as training loads are increased or decreased.*
5. Attrition between commissioning and entrance into UPT, and attrition during UPT.

Such of the above factors as pertain to the management of the commissioning process are discussed in this Memorandum, in sections arranged as follows:

III. Air Force Academy (AFA)
IV. Reserve Officer Training Corps (ROTC)
V. Officer Training School (OTS)

The estimating equations, developed in this Memorandum, take into account attrition factors so that the required flows of pilot candidates through the three commission training programs may be estimated for any given UPT entrance requirement. Training capacities, which set limits on the number of pilot candidates that may be produced from each commissioning source, are also considered.

Section II contains some introductory information about student pilot attrition during UPT and the UPT input mix. Some familiarity with these aspects of UPT is needed for ready understanding of the commissioning process. The information is included here for the convenience of those who may not yet have read Volume IV of the Pilot Training Study Study** that deals, comprehensively, with all cost-related aspects of the UPT program.

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*Throughout this Memorandum, the term "program costs" is used to encompass all costs of the officer-production programs of the Academy, ROTC and OTS, respectively. Costs peculiar to pilot candidates, that is, flight orientation courses conducted by the Academy and ROTC, are dealt with separately. PCS (permanent change of station) moves to UPT are also treated as a separate element of pilot candidate costs. For this purpose, the standard cost factor ($710) used by the Air Force for all PCS moves to training sites was used. The PCS factor is computed regularly and published in AFM 172.3, USAF Cost and Planning Factors. In the treatment of OTS pilot candidate costs, the term "accession costs" is used to include the PCS costs, and recruiting and post-graduation clothing-issue costs that are not applicable to the Academy and ROTC.

**See Preface.

II. RELATION OF UNDERGRADUATE PILOT TRAINING TO PRECOMMISSIONING TRAINING

From one standpoint, precommissioning training, whether by the Air Force Academy, ROTC, or Officer Training School, consists of a flow of students that may be broken down into three numbers: the number entering training (Input), attrition during training, and the number graduating (production). This is equally true of Undergraduate Pilot Training.

The UPT production goal and student flow within UPT determines the total input required from the three pilot candidate sources; that is, the programmed number of UPT graduates plus the estimated number of attritions during UPT training determines the required input.

UPT PRODUCTION

Table 1 shows how many from each input source graduated by fiscal year since 1961 and the number programmed for FY 1969.

Table 1

UPT PRODUCTION BY SOURCE, BY FISCAL YEAR

Fiscal Year	AFA	USMA	USNA	ROTC FIP[a]	ROTC No FIP	OTS	Other Non-Rated	Rated	OCS[b]	Avn Cad[b]	Total[c]
1961	163	18	37	708	170	---	96	11	61	531	1795
1962	161	12	11	767	147	18	91	19	73	5	1304
1963	364	12	15	791	121	129	98	15	88	---	1433
1964	322	8	12	741	136	250	212	47	47	---	1675
1965	347	15	6	867	167	365	92	118	15	---	1992
1966	366	9	2	972	118	277	69	186	---	---	1969
1967	294	14	6	1096	144	704	356	154	---	---	2768
1968	249	--	7	1224	191	899	300	222	---	---	3092
1969	375	7	1	1022	144	1600	222	74	---	---	3445

[a]FIP is the acronym for Flight Instruction Program, a course of flight instruction in light, land-aircraft given to most ROTC pilot candidates.

[b]The Aviation Cadet program provided a large input into UPT until 1961 when discontinued. Officer Candidate School (OCS) provided a smaller, but significant, input until discontinued in 1965.

[c]Excludes Air National Guard (ANG), Marines and Foreign Nationals.

UPT ATTRITION DURING TRAINING

Attrition refers to students who "wash out" or discontinue training. Table 2 shows, for a typical year (FY 1967), the reasons for and percentage of attrition by source (Academy, ROTC, OTS, and rated and nonrated officers already on active duty).

Table 2

NUMBER OF STUDENTS ATTRITED, BY REASON, BY SOURCE, FY 1967

Source	Number Entered	Training Deficiency	Medical Reasons	Fear/ SIE[a]	Fatality/ Other	Number Attrited	Percent Attrited
Rated	365	8	2	3	1	14	3.8
ROTC FIP	1337	156	27	73	1	257	19.2
ROTC No FIP	218	52	5	17	1	75	34.4
Academy	353	34	14	3	0	51	14.4
OTS	1018	214	23	92	4	333	32.7
Nonrated	201	31	11	17	1	60	29.9
Total	3492[b]	495	82	205	8	790[b]	22.6
Percent		62.65	10.37	25.97	1.01	100.00	

SOURCE: RCS AF-T32, Flying Training Status Report, Hq ATC.

[a]Fear of flying and self-initiated elimination (SIE).

[b]Table 1 shows 2768 graduates in FY 1967 versus 2702 (3492 minus 790) in Table.2. This accounting discrepancy occurs because of sickness and emergency leave holdovers from one class to another.

It will be noted that rated personnel on active duty (mostly navigators) had, by far, the lowest attrition rate. Academy graduates did well as did the ROTC graduates who had FIP (preliminary flight instruction) training. The highest rates were experienced by OTS graduates and nonrated officers because they had had no exposure to flight indoctrination.

This points to the fact that the number of UPT entrants required to produce a given number of UPT graduates is dependent on the input mix.

EXPECTED UPT INPUTS BY SOURCE

For FY 1969, programmed UPT inputs and UPT graduates were increased to 4761 and 3445, respectively, as shown in Table 3. These numbers will probably increase in future years. Anticipated inputs by source are as follows:

1. Air Force Academy enrollment increased to 3400 in FY 1969 and will be further increased to a level-off figure of 4400 commencing with FY 1973. Because about 70 percent of the graduates elect to take pilot training, the expectation is that there will be commensurate increases in the number entering UPT from the Academy.
2. The ROTC program, conversely, has been cut back. Approximately 4500 were programmed to graduate in FY 1969 as compared with 5708 in FY 1968. Experience shows that about 34 percent, or approximately 1600, ROTC students will be candidates for pilot training.
3. Because UPT accepts all Academy and ROTC graduates who are candidates for pilot training, the Officer Training School is relied upon to provide UPT entrants in whatever number is needed to fill such of the UPT input quota as is not taken by Academy and ROTC graduates. This is possible because OTS is the most flexible of the major input sources. OTS training time is approximately three months as compared to four years for the Academy and two to four years for ROTC. OTS has been receiving about 30,000 applicants annually. It is questionable whether applications will continue at this level when the pressure of the wartime military draft lessens, but it seems certain that, whatever the reduction, OTS will continue to provide pilot candidates in numbers sufficient for any foreseeable level of pilot production.

Table 3

UPT PROGRAMMED INPUT, PREDICTED ATTRITION, AND DESIRED PILOT CANDIDATE PRODUCTION FOR FY 1969

Source	Pilot Candidate Input	Predicted Attrition		Desired Production
		Percent	Number	
Academy	461	17	78	383
ROTC	1458	20	292	1166
Rated on active duty	80	8	6	74
Nonrated on active duty	300	26	78	222
Totals without OTS	2299		454	1845
OTS	2462		862	1600
Grand Total	4761		1316	3445

UPT CLASS ENTRY SCHEDULE

Once the desired UPT input mix has been set for the year, the annual totals from the various sources of pilot trainees are scheduled into eight 53-week training classes. Class starting dates are staggered.

Immediately after graduation in June, Academy graduates take 30-60 days' leave and arrive at UPT bases beginning in July. ROTC graduates have first priority for June starting classes and for classes starting in the fall. OTS graduates fill up classes at other times.

III. AIR FORCE ACADEMY PILOT TRAINING COSTS

THE AIR FORCE ACADEMY PROGRAMS

This subsection describes the Air Force Academy (AFA) program with emphasis on aspects relating to the production of pilot candidates.

Purpose of the Academy

The mission of the Air Force Academy is to provide instruction, experience, and motivation so that each cadet will graduate with the knowledge and qualities of leadership required of an officer in the Air Force. The Academy develops attributes and skills needed for cadet and commissioned life and provides both a broad military education and a broad general education leading to a baccalaureate degree.

Location and Facilities

The Academy campus consists of 18,000 acres located eight miles north of Colorado Springs, Colorado. It provides classrooms, lecture halls, libraries, and laboratories; chapels; a theater; drill and parade grounds; indoor and outdoor athletic facilities (to include a golf course); dormitories and dining facilities for cadets and enlisted personnel; housing areas for the all-military faculty; a shopping center; cadet stores, hospital and dispensary facilities and maintenance shops. In short, the physical plant provides everything needed to make the Academy a self-contained institution.

Curriculum

The four-year curriculum is based on basic education courses consisting of 105 semester hours of academic studies, 28 of military training and 14 1/2 of physical education. Additionally, each cadet devotes about 40 semester hours to earn an academic major in one of 29 subjects of his choice. Fifteen of the academic majors are in humanities and social sciences; the other 14 in engineering and allied sciences. About 170 semester hours of the 188 semester hours training

total are carried out during four 38-week academic years. The other 18 are conducted during four summer training sessions.

Training as a pilot is not essential to an Air Force career but most senior command and staff positions require a flying background. For this reason, a majority of Academy graduates take pilot training. The first class of 306 cadets was sworn in July 1955 and graduated in June 1959. Ten classes have graduated from the Academy through June 1968.

Entrance Qualifications for Pilot Training. Nominations to the Academy are made in several categories, principally by members of Congress* and the President. An applicant must be unmarried; must meet age, citizenship and character standards; and must pass medical and physical aptitude examinations and College Board tests. The most significant among these requirements, from the point of view of pilot candidate flows, is the medical standard, in particular the vision requirements. Waivers from meeting rigid medical standards are granted some cadets to permit them to enter the Academy. Because of this latitude, not all Academy graduates are qualified for pilot training.

Student Benefits and Service Commitments

In addition to free tuition, food, quarters and medical care, each cadet receives $160.50 per month for clothing, supplies, laundry, and personal expenses. Each appointee is requested to deposit $300 to help pay the initial cost of uniforms and other personnel expenses during the first year** of training. His deposit account is augmented by a $600 interest-free loan that is recouped by small deductions from his $160.50 monthly allowance. Upon enrollment, AFA cadets agree to accept an appointment and serve as a commissioned officer in a Regular component of one of the armed forces for five years.

*Of the 4400 cadets, about 2600 are congressional appointees.

**In Academy terminology, cadets enter the Academy as Fourth Classmen. A cadet progresses from Fourth Classman through Third, second, and First to graduation.

Pilot Indoctrination Program. The Air Force Academy does not provide the extensive flying training necessary to qualify a cadet for an Air Force aeronautical rating. That is the job of UPT. The Air Force Academy has, however, inaugurated a Pilot Indoctrination Program (PIP) which consists of flight instruction in T-41 aircraft. All cadets who wish to be pilots enter PIP. The first group began this training in January 1968. The effect upon UPT attrition rates will not be known for some time, but the already-low AFA rate will doubtless go down still further.

Scheduling AFA Graduates Directly into UPT Classes. The Air Training Command accepts into UPT all Academy graduates who are pilot-qualified and elect to take flight training, without regard to UPT quotas. As stated earlier, AFA graduates take 30-60 days leave and enter UPT classes beginning in July. Generally, all those whose initial assignments are to UPT will have been assigned to UPT classes by mid-September.

Delayed Entries into UPT. Some AFA graduates enter the Air Force Institute of Technology (AFIT) Master's Degree Program at Georgetown, Purdue, UCLA, or North Carolina State universities. Some subjects taken at the Academy are accepted for graduate credit, and upon completion of the seven-month in-residence portion, those scheduled for pilot training enter UPT classes, usually in March.

Others receive scholarships and fellowships in such programs as the Rhodes Scholarships for advanced study at Oxford University, the National Science Foundation Graduate Fellowships, Atomic Energy Commission Fellowships in Nuclear Physics and Engineering, Guggenheim Fellowships in Jet Propulsion and Flight Structures, and Fulbright and Olmsted Scholarships for graduate study at foreign universities. Those who are to become pilots enter UPT but at a later date than others in their AFA graduating class.

The combined strength of the two advanced studies groups is small, ranging from 29 to 51 over a span of six fiscal years.

ACADEMY STUDENT LOADS, ATTRITIONS AND OFFICER PRODUCTION

This subsection provides historical data and predictions concerning cadet strengths, attrition and pilot candidate officer production.

Academy Attrition by Class

Table 4 shows, for fiscal years 1959 through 1968, the number and percent of attritions among each of the four annual classes. It also shows the average attrition rate in each group over the entire period.

Estimated Percentage of Fourth Classmen who will Graduate. The foregoing attrition rates, by class, are now applied to a hypothetical entering class of 1000 cadets to estimate the percent that may be expected to persist to graduation in future years. Table 5 shows the computation. Based on historical data, the expectation is that 67.8 percent of those entering the Academy will persist to graduation and be commissioned.

Number of Graduates who have Entered UPT, Fiscal Years 1963-1968. It was previously noted that not all AFA graduates are qualified for pilot training. Table 6 presents historical information about the percentage of graduates that actually enter UPT. This table shows, based on the six-year average, that about 74 percent of the Academy graduates entered UPT either immediately upon graduation or later. The downward trend in the percentage is such that a figure of 70 percent may be more probable in future years and is therefore suggested for estimating purposes.

Projections of Academy Graduates and Pilot Candidates. Application of historically-derived factors (for graduates and pilot candidates) gives an indication of the approximate number of entering cadets who may be expected to graduate and the approximate number of graduates who may be expected to enter UPT from 1969 and subsequent graduating classes. These estimates are shown in Table 7.* It should be noted that the estimated numbers of graduates and UPT entrants are subject to normal predictive uncertainty.

*Also see Appendices A, B, and C.

Table 4

ACADEMY ATTRITION PER FISCAL YEAR, BY CLASS

Fiscal Year	Fourth Classmen			Third Classmen			Second Classmen			First Classmen		
	Start	End	Attrition (%)	Start	End	Attrition (%)	Start	End	Attrition (%)	Start	End	Attrition (%)
1959	458	366	20.1	257	240	6.6	242	229	5.4	207	207	.0
1960	739	594	19.6	366	323	11.7	239	221	7.5	229	227	0.9
1961	775	583	24.8	586	546	6.8	325	307	5.5	221	217	1.8
1962	800	674	15.7	584	551	5.7	541	511	5.5	305	298	2.3
1963	757	609	19.6	674	620	8.0	554	519	6.3	512	499	2.5
1964	853	653	23.4	613	564	8.0	621	570	8.2	520	499	4.0
1965[a]	---	---	---	---	---	---	---	---	---	---	---	---
1966	1054	853	19.1	769	715	7.0	558	573	3.8	478	469	1.9
1967[a]	1034	874	15.5	---	---	---	---	---	---	537	524	2.4
1968	1033	840	18.7	873	787	919	757	650	8.0	620	612	1.3
Total	7503	6046	19.4	4722	4346	8	3837	3584	6.6	3629	3552	2.1

SOURCE: Directorate, Personnel Training and Education, Hq USAF.

[a]Attrition rates omitted because they are inflated due to honor violations. (See Appendix A.)

Table 5

PROJECTION OF NUMBER OF FOURTH CLASSMEN WHO WILL GRADUATE

	Fourth Class	Third Class	Second Class	First Class
Number entering	1000	806	742	693
Percent of attritions	19.4	8.0	6.6	2.1
Number of attritions	194	64	49	15
Number finishing	806	742	693	678

[a]Total attrition from entry to graduation is 32.2%.

Table 6

ACADEMY GRADUATES ENTERING UPT

Fiscal Year	Total Graduates	Physically Qualified for UPT	Graduates Entering UPT	
			Number	Percent
1963	499	445	423	85
1964	499	440	423	85
1965	517	401	376	73
1966	469	334	321	68
1967	524	360	330	63
1968	612	448	430	70
Total	3120	2428	2305	74

Table 7

PROJECTED NUMBERS OF CADETS
ENTERING THE ACADEMY, GRADUATING AND ENTERING UPT

Number	Class of				
	1969	1970	1971	1972	1973
Entering Academy[a]	1054	1034	1033	1250	1360
Graduating	676	723	710	847	922
Entering UPT	473	506	497	593	645

[a]SOURCE: Directorate, Personnel Training and Education, Hq USAF.

PILOT CANDIDATE VERSUS OTHER CADET COSTS

Pilot candidate costs are higher than those of other Academy cadets because the latter are not given the Pilot Indoctrination Program (PIP) course. Elements of pilot candidate costs are as follows:

1. Academy operating costs per graduate.
2. Pilot indoctrination costs per pilot-candidate graduate.
3. PCS (permanent change of station) moves to UPT.*

Academy Operating Costs Per Graduate

The cost of producing an Academy graduate is a function of the size of the Academy program. Since the AFA is a relatively new institution and since it has yet to reach its stable operating level, the cost data available for analysis cover a reasonably wide range. Cost data used to develop estimating relationships consist of budget costs for prior years and programmed costs from the USAF Force and Financial Program (F&FP) for future years. (See Appendices D and F.) These cost data have been adjusted in three ways:

1. Military construction costs and costs of equipment already paid for have been eliminated. Completion of the bulk of the Academy expansion program by 1968 means that these are sunk costs that may be disregarded in future year estimates.

2. Retirement pay has been excluded, but these costs may be added to the total costs if desired.

3. Adjustments have been made for several increases in pay and allowances that the Academy operating staff has received in past years.

Academy Class Strengths. Table 8 shows year-end Academy staff strengths, actual for fiscal years 1966 through 1968 and projected by the USAF F&FP for fiscal years 1969 through 1973.

*The same cost figure ($710) is used for PCS travel to UPT from all three officer-production sources. This is the latest cost factor used by the Air Force for estimating the cost of PCS moves of officers to training sites. (Table 19, Air Force Manual 172-3D, USAF Cost and Planning Factors Manual, 27 October 1968.)

Table 8

ACADEMY STAFF STRENGTHS

	1966	1967	1968	1969	1970	1971	1972	1973
Officers	664	712	780	858	918	918	918	918
Airmen	860	862	842	866	880	880	880	880
Civilians	1739	1788	1832	1912	2118	2118	2118	2118
Total staff	3263	3352	3454	3636	3916	3916	3916	3916

Pay and allowances for the Academy staff amount to more than three-fourths of the total Academy operating costs. Before a regression curve could be constructed, total costs for past fiscal years had to be adjusted for increases in Academy personnel costs. The index in Appendix E was used to adjust Academy costs for prior years to 1968 dollars.* Table 2, Appendix F, shows the effect of these adjustments on the total costs for fiscal years 1963-1967.

Academy Costs and Graduates. Table 9 presents the adjusted costs for the AFA program for a six-year period, together with the number of graduates. Since the size of the entering class increased steadily during this period, the instructional and support load also increased without being immediately reflected in the number of graduates. Consequently, it could not be expected that there would be a valid relationship between the costs and the number of graduates.

Table 9

AFA COSTS AND GRADUATES, BY FISCAL YEARS

(Costs in Millions)

	1963	1964	1965	1966	1967	1968
Cost[a]	$38,519	$40.198	$38.514	$41.403	$41.174	$43.850
Graduates	499	499	517	469	524	612

[a]Adjusted to FY 1968 dollars. See Appendix F, Table 2.

*Appendix E factors are applied also to ROTC and OTS costs.

A more proper relationship would be expected between AFA costs and the number of cadet man-years completed annually, since this is a truer measure of the size of the program. From this information, the cost of a cadet man-year may be calculated, and then used to estimate the cost per graduate. This is done by multiplying the cost-per-cadet man-year by the number in each class completing the year, which gives the cost-per-class divided by the number of graduates. The data are summarized in Tables 10 and 11.

Table 10

FISCAL YEAR CADET MAN-YEAR COSTS AND MAN-YEARS BY CLASS YEAR

Fiscal Year	Cost Per Man-Year	Man-Years by Class Year				
		1969	1970	1971	1972	1973
1966	$15,994	853	---	---	---	---
1967	15,369	757	874	---	---	---
1968	14,947	690	790	843	---	---
1969	14,311	676	738	776	1007	---
1970	13,765	---	723	725	926	1096
1971	13,401	---	---	710	865	1008
1972	13,070	---	---	---	847	941
1973	12,964	---	---	---	---	922

Table 11

TOTAL COST AND COST PER GRADUATE, BY CLASS YEAR ($)[a]

	Year				
	1969	1970	1971	1972	1973
Fourth Classmen	13,642,882	13,432,506	12,600,321	14,411,177	15,086,440
Third Classmen	11,634.333	11,808,130	11,105,336	12,747,390	13,508,208
Second Classmen	10,313,430	10,561,518	9,979,625	11,591,865	12,298,870
First Classmen	9,674,236	9,952,095	99,514,710	11,070,290	11,939,844
Total	45,264,881	45,754,249	43,199,992	49,819,722	52,833,362
Graduates	676	723	710	847	922
Cost per graduate	66,960	63,284	60,845	58,819	57,303

[a]It is emphasized that these costs are based on programmed costs and programmed student loads. If either changes, the cost per graduate will change. It should also be noted that when AFA reaches the constant level of production, programmed to be achieved in FY 1973, the relationship between program costs and number of graduates will then be valid.

Costs per class and costs per graduate, by class year, are derived from these data. For example, man-year costs shown in Table 11 as having been incurred by the graduating class of 1969 are $13,642,882 for Fourth Classmen in FY 1966 (853 man-years x $15,944 average cost per man-year); $11,643,333 for Third Classmen in FY 1967 (757 man-years x $15,369). By the same estimating procedure, costs for Second and First Classmen for fiscal years 1968 and 1969 are shown as $10,561,518 and $9,952,095, respectively, for a total estimated 1969 class cost of $45,264,881.

Based on the foregoing, estimates of costs for class years 1969 through 1973 are calculated in total and by graduate. The projections are made on the assumption that the Academy will continue to operate in much the same way as at present with regard to curriculum, instructional methodology and technological aids.

As previously mentioned, a relationship between AFA costs and the number of cadet man-years is to be expected.

Figure 1 is a scatter diagram of the data in Appendix F. This data covers the entire history of the Air Force Academy and, therefore, includes a range of student loading. The range is wide enough to show the expected high degree of correlation between student load and costs. From an analytical standpoint, some additional data points at low student loads would have been desirable but these, of course, do not exist.

A linear regression analysis was performed on the data, and the following equation was produced:

$$\text{Program cost (\$ million)} = 24.70106 + 0.0066X$$

where X = cadet man-years.

The equation and the data are plotted in Fig. 1. The equation may be used to estimate the program cost of the Academy at various student loads. It may also be used to distinguish between the fixed and variable costs. The intercept of the regression line on the ordinate may be interpreted as the fixed cost of operating the Academy. It represents approximately half of the total current program costs. This

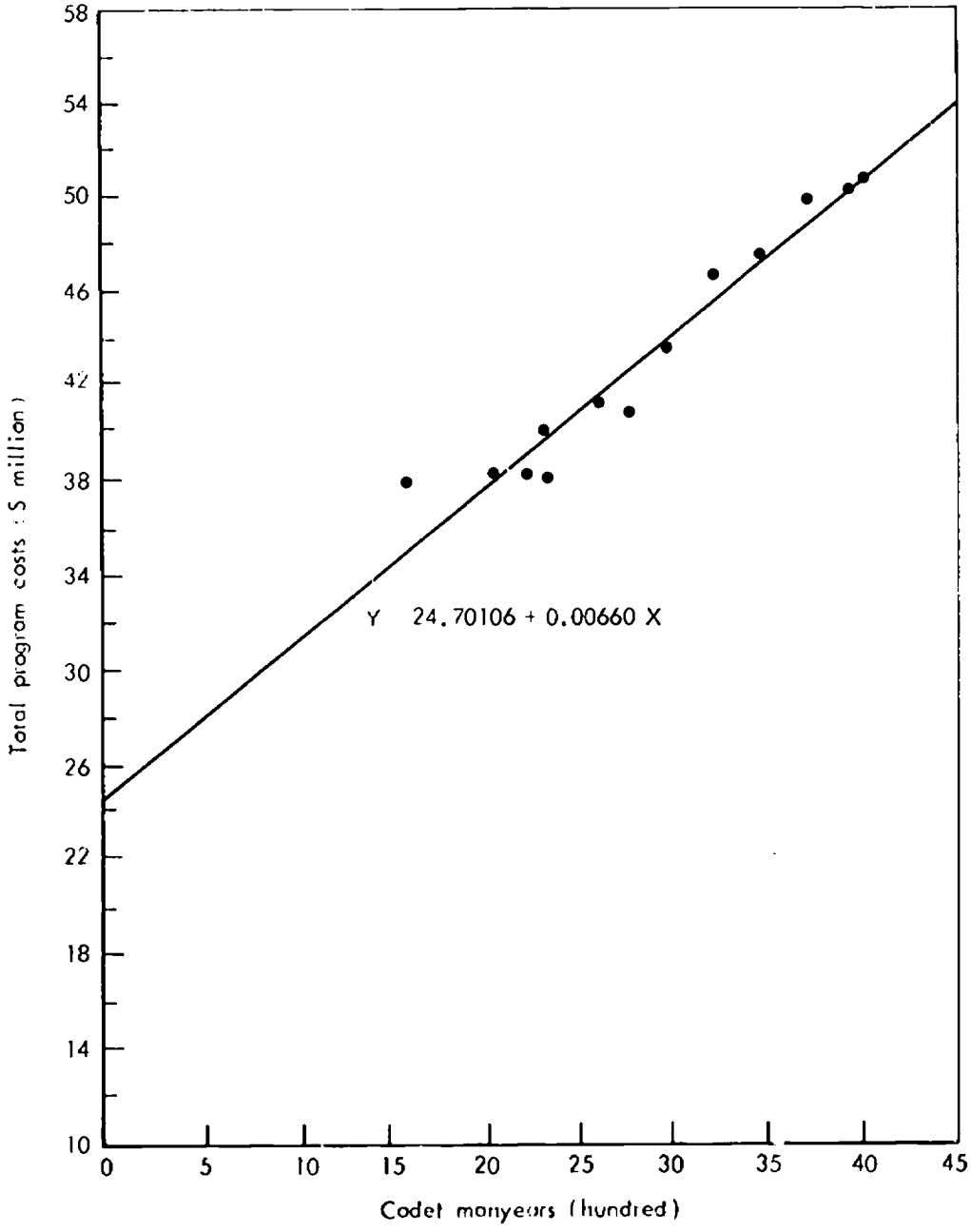

Fig. 1—USAF academy program costs versus loading

ratio of fixed to total costs is probably comparable to that experienced by similar educational institutions. The slope of the regression line represents the variable costs that are a function of the student load, or the number of cadet man-years.

The linear equation produces an estimate of marginal costs that is constant at all levels of loading. With current patterns of attrition, it requires 4.3 cadet man-years to produce one graduate. Because the marginal cost per cadet man-year is $6600, each additional graduate represents an additional cost of about $28,000 to the Air Force.

ACADEMY PILOT INDOCTRINATION PROGRAM

The PIP program is the second component of per-pilot-candidate costs. Its costs are included here even though excluded from the Academy cost records.

PIP training is given by the 3253d Pilot Training Squadron (33 officers, one NCO and four civilians) at Peterson Field, near the Academy. Training is given one group in a one-month intensive course commencing in mid-June; to another in a class from August to December; and to a third in a class starting in January and finishing in May. As stated earlier, the first group began PIP training in January 1968.

Table 12 summarizes PIP flows and total program costs. (Flow details are shown in Table 1, Appendix G.) Programmed factors, to include a six percent attrition rate, were used because the program has not been in operation long enough to accumulate experience factors.

Table 12

PROGRAMMED PIP COSTS[a]

	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973
Total PIP costs (rounded to thousands of dollars)	$[illegible]	$419	$443	$467	$468	$468
Course completions	210	579[b]	590[b]	572[b]	572[b]	572[b]
Cost per completion	1214	724[b]	751[b]	816[b]	818[b]	818[b]

SOURCE: Directorate, Personnel Training and Education (AFPTR).

[a]Costs include only O&M and Military Personnel Appropriation costs because the cost of procuring training aircraft (T-41) has already been incurred and is treated as a sunk cost.

[b]Projected.

PILOT INDOCTRINATION PROGRAM COSTS

Cost data for the PIP are limited because it was not started until mid-year 1968. Table G-2 displays the actual PIP costs for FY 1968 and the programmed PIP costs from FY 1969 through FY 1973. Table 1 of that appendix shows the number of students who entered in FY 1968 and the number programmed for FY 1969 through FY 1971. This provides four data points from which to derive an estimating relationships.* These data points are essentially identical, however, and indicate that the cost of processing about 580 students through the PIP course is approximately $450,000.

As a result, it is not possible to produce a meaningful relationship between program cost and program loading, other than to surmise that for the years for which information exists, the program cost has been as noted above. These figures indicate an average cost per student of about $800, and since a portion of the program costs is probably fixed, the marginal cost of incremental students would be somewhat less than $800. Aircraft operating and maintenance costs are about $300** per student, which would indicate that marginal costs are probably between $300 and $800.

*The FY 1968 data are included even though the data reflect only part of the year because the level was the same as in subsequent years.

**Cost data from Air Force Manual 172-3, USAF Cost Planning Factors, 27 October 1968.

IV. ROTC PILOT CANDIDATE COSTS

THE RESERVE OFFICER TRAINING CORPS PROGRAM

This section focuses on the costs of pilot candidates entering undergraduate pilot training (UPT) from the Air Force ROTC program. Its object is to provide a means of estimating how many UPT candidates will be produced each year from the ROTC program and at what cost.

Purpose of ROTC

The Air Force ROTC program provides training at civilian colleges and universities in a general military science curriculum leading to a commission as a second lieutenant in the Air Force Reserve.* Its purpose is to provide the the general type of training required for an Air Force officer.

Location and Direction of ROTC Programs

The Air Force ROTC, with headquarters at Maxwell AFB, Alabama, is an integral part of the Air University command.

There is an ROTC training detachment at each of about 170 colleges and universities throughout 47 states, the District of Columbia, and in Puerto Rico. The number of participating schools has decreased from 186 since FY 1965. A small further cutback is in the offing, but the reduced number will be more than needed to meet the annual production goal of 4500 officers programmed in the Air Force Force and Financial Plan (F&FP) for fiscal years 1969 through 1973.**

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*Outstanding ROTC cadets are designated Distinguished Graduates and may receive regular commissions in the Air Force.

**Annual officer production goals are set by commissioning category. For FY 1969. the 4500+ goal is apportioned by category somewhat as follows:

Candidate Category	Approximate Number	Percent
I-P Pilot	1600	35
I-N Navigator	315	7
II Scientific and Engineering	1260	28
III Other Academic	1350	30

Training at each participating institution is under the overall direction of a Professor of Aeronautical Studies (PAS).

ROTC Program Content

ROTC consists of a four-year course and a two-year course:

The Four-Year Program. The four-year program is divided into two phases: The General Military Course (GMC) occupies the first two years. It is designed to acquaint the student with the fundamentals of national security through the study of "World Military Systems," that is, of world military power and its present and future implications. It gives the student a general introduction to the principles and techniques of modern warfare. It also requires four weeks of field training at an Air Force base.

The last two years of the four-year program are identical in academic content with the two-year program described below.

The Two-Year Program. This is the Professional Officer Course (POC) for selected students who desire training leading to active duty commissioned service. It requires participation in three classroom hours of weekly instruction for the two academic years. The first year of POC is devoted to studies of the development of U.S. air power, the organization and functions of the Defense Department, Air Force doctrine and deployment, and aeronautics and space operations and development. The second year concentrates on professional responsibilities, leadership, military justice, and management principles, practices and controls. Also, as described below, it includes a six-week training encampment at an Air Force base and a Flight Instruction Program (FIP) for pilot candidates.

Field Training

The four-week and six-week summer training courses are given at 15 Air Force bases throughout the United States. They provide cadet orientation, physical training, junior officer training, survival

training, aircraft and crew indoctrination, small arms familiarization and instruction in the organization and functions of an air base. The six-week course also includes a concentrated study of "World Military Systems." This is the subject to which (as above noted) the first two years of the four-year course are mainly addressed.

Flight Instruction Program

The Flight Instruction Program (FIP) is an addendum to the POC curriculum. It is a contractor-operated program of flight training in light, reciprocal aircraft and is provided by most, but not all, ROTC colleges. POC cadets in Category I-P (pilot category) at FIP-participating schools are normally required to complete FIP training as a prerequisite to ROTC completion and commissioning. FIP training may qualify a cadet for a Federal Aviation Agency (FAA) Private Pilot's License, but this is not a FIP-completion requirement.

The training gives POC Category I-P students first-hand experience in flying, navigation and air traffic control techniques and serves to screen out those who lack aptitude for UPT. (In Section II, Table 2, it was shown that FIP participants experience a 19.2 attrition rate in UPT versus 34.4 percent of those who had not received FIP training.)

FIP provides up to 20 hours of dual flight instruction and 15 hours of solo flight instruction, plus a final flight progress check of not more than 1-1/2 hours.* It also includes a minimum of five hours of ground school instruction in FAA regulations, care and servicing of aircraft and engines, navigational methods, meteorology and flight safety practices. This instruction does not duplicate (reach the level of) the UPT training.

This course screens out, at relatively low cost, many who would not be successful UPT trainees.

ROTC QUALIFICATION REQUIREMENTS

Applicants are limited to male students who are able to graduate and be commissioned before age 30. Applicants for Financial Assistance

*A minimum of 19 hours of flight instruction and a satisfactory flight progress check may qualify for FIP course completion.

Grants (see "Pay and Other Benefits," below) must be able to meet all commissioning requirements before reaching age 25.

Prior to 1965, only freshmen could enter the ROTC program, that is, they had to commence with the GMC. Now a student may enter directly into POC provided that he has two academic years remaining, at either undergraduate or graduate level, or a combination of the two, and that he successfully completes the six-week summer field training course.

All applicants, whether for the four-year or two-year course, are given the Air Force Officer Qualifying Test. This is a written, nationwide competitive examination. Those who qualify must then pass the AF medical evaluation and be selected by an interview board composed of Air Force officers.

Applicants for FIP training must be members of the POC in Category I-P and must be within 12 months of expected commissioning.

PAY AND OTHER BENEFITS

All uniforms and textbooks are provided by the Air Force t GMC and POC students. POC cadets receive a $50 monthly non-tax lowance for a maximum of 20 months.

Financial Assistance Grants (scholarships) are available t demically and physically qualified participants in the four-ye Scholarship cadets receive all of the foregoing benefits plus fu tion, laboratory and incidental fees, and a $75 extra allowanc books. The ROTC currently has about 5000 cadets under scholarsh and plans to have 5500 (the maximum authorized by law) in FY 19 beyond. The scholarships are awarded competitively and, unlike financial assistance grants, do not depend upon family income.

All cadets attending field training receive a travel allow and from the AFB training site. Those attending the four-week e ment receive $5.35 per day (50 percent of the base pay of a Sec Lieutenant with less than two years of service).* POC Cadets r the six weeks of field training are paid $3.19 per day (the sar basic airman with less than four months' service). The $3.19 d ment is in addition to the $50 monthly on-campus allowance.

*Coincidentally, this is the pay of an Air Force Academy cad

Any cadet in uniform may travel by rail at reduced rates on a space-available basis. POC cadets may also travel within the United States on space-available military aircraft without any charge.

ENROLLEE SERVICE COMMITMENTS

All ROTC cadets must agree to serve not less than four years on active duty after commissioning. Before entering POC as a rated category (I-P or I-N) candidate, the cadet must enlist in the Air Force Reserve and agree to serve at least five years* on active duty after being commissioned as a rated officer (pilot or navigator).

Prior to being accepted for a four-year Financial Assistance Grant, the applicant must enlist in the Air Force Reserve for eight years or until he completes commissioning requirements. Also, he must agree to enter the ROTC program in a pilot (I-P) or navigator (I-N) category, and agree to enter UPT upon graduation.

MANAGEMENT OF ROTC PRODUCTION GOALS

Commencing with fiscal year 1969 and extending through FY 1973, the ROTC production objective is to produce about 4500 graduates per year,** with an estimated 35 percent (about 1600) qualified to enter UPT.

Management of these goals does not require an estimating relationship because they are achieved by controlling the number admitted to POC in each of the four candidate categories: I-P (pilot), I-N (navigator), II (scientific and engineering), and III (other). This may

*The service commitment for rated candidate graduates will be increased from five to six years in 1970. (A four-year commitment is required of POC students who are not candidates for rated specialties.)

**The 4500 goal is a reduction from about 5700 in FY 1968 but will produce substantially more than one-third of the graduates needed, from all sources, for fiscal years 1969-1973. The principal reason is that ROTC cadet quality is going up. Students accepted for POC in the academic years 1967-1968 had compiled a 3.1 grade point average that is far above all all-men's grade average at campuses generally.

readily be done because there are three or four times as many students in the second year of ROTC as in the third and, as a consequence, admission into the POC is highly competitive. Thus, the total number of cadets to be admitted into POC, and the mix by candidate category within that total, may be regulated to adjust to Air Force officer-production requirements both in total and by pilot and other candidate category.

Further, the control of POC flow is exercised by month of commissioning as well as by class year. Before a student is admitted into the POC, a specific month is established for his commissioning. This is a scheduling and control device for managing the monthly inputs of officers into the Air Force Reserve. A cadet cannot change his established commissioning month without ROTC approval and his academic progress is closely monitored to assure that the commissioning month remains valid.

After the third-year enrollment quotas are filled, the graduate production potential is fairly well set and can be projected, by category, based on estimated attritions. The output may be decreased during the two-year POC period but cannot be increased.

For these reasons, enrollment in the POC is the initial point for controlling and tracking the flow of ROTC graduate production in total and by category.

Past Record of Commissions Earned by ROTC Graduates

Table 13 shows the number of commissions issued in calendar years 1947 through 1950 and in academic years thereafter through 1963.

This shows that ROTC has been responsive to Air Force needs by adjusting the commissioned officer output.* The fact remains that there is a four-year lead time because input into the POC (third ROTC year) is the controlling factor in determining graduate outputs. This is demonstrated in Tables 14 and 15.

*It is not possible to compute the ROTC maximum capacity because the size of the student load is a function of the number of participating colleges and the number of ROTC detachments. Although some colleges have recently withdrawn from the ROTC program, many others are applicants for participation. The maximum capacity, therefore, would be beyond any foreseeable need for increased officer production.

Table 13

COMMISSIONS EARNED BY ROTC GRADUATES[a]

Year	Commissions	Year	Commissions
1947	2	1956	7,722
1948	1,470	1957	5,671
1949	2,960	1958	4,066
1950	4,395	1959	3,759
1951	7,031	1960	3,430
1952	8,745	1961	3,295
1953	10,355	1962	3,466
1954	10,075[b]	1963	3,487
1955	10,679[b]		

SOURCE: Directorate for Statistical Services, Office of the Secretary of Defense.

[a]1947 through 1950 are calendar years; others are academic years which, for purposes of this report, run from October (beginning of Fall quarter) through September.

[b]Data for academic years 1954 and 1955 exclude 4653 individuals who were given "Certificates of Completion" in lieu of commissions.

Table 14

FIRST-YEAR ENROLLMENT VERSUS GRADUATES[a]

Fiscal Year	Enrollments	Graduates	
		Number	Percent
1964	54,966	3,962	7.21
1965	57,406	4,509	7.85
1966	40,895	4,790	11.71
1967	35,029	5,896	16.83
1968	28,128	5,708	20.29
Total	216,424	24,865	11.49

SOURCE: AFROTC Form 0-3, Report of Program Status, as of 31 October of each year.

Table 15

RELATIONSHIP OF THIRD-YEAR ENROLLMENTS TO GRADUATES

Third-Year Enrollments		Third-Year Enrollees Persisting to Graduation			
(1) Class of	(2) Number	(3) Total	(4) Percent	(5) Category I-P	(6) Percent
1965	7,333	4,509	61.45	1,496	20.40
1966	6,917	4,790	69,25	1,577	22,80
1967	6,426	5,896	91.75	1,914	29.79
1968	6,366	5,708	89.67	1,777	27.91
1969	4,876	4,696	96.31	1,777	36.44
Total	31,918	25,599	80.20	8,441	26.45

SOURCE: AFROTC Form 0-3, Report of Program Status as of 31 October of each year. (See Appendix G.)

It will be noted that there is no meaningful relationship, by fiscal year, between first-year entrants and production of graduates. Even though the number of first-year enrollments has been halved, the desired number of graduates has been maintained. This reflects a greatly increased emphasis on student quality. The minimum requirement for enrollment has been increased from the upper 30th to the upper 10th percentile of the Air Force Officer Qualification Test (AFQT). As the result, first-year enrollment for FY 1969 was further decreased to 25,966. This progressive tightening was possible because competitive scholarships, provided by the ROTC Revitalization Act of 1964, made outstanding students increasingly available.

Attrition During POC

Table 15 shows the number of third-year enrollments and number of graduates, by class year. From these data will be seen that for class years 1965 through 1968 the number of cadets admitted to the POC decreased 13.2 percent but that the total number of graduates and the number of graduates in Category I-P increased 17.8 and 15.8 percent, respectively.

As explained in the preceding paragraph, the striking increase in the numbers who persisted to graduation is attributable to tight POC admission standards.

Because there is a two-year interval between POC admission and graduation, the full effect of more stringent POC entrance criteria has probably not yet been realized. The expectation, therefore, is that an even larger percentage of the Class of 1969 will persist to graduation than was the case in earlier classes. For this reason, the Air Force admitted only 4876 into POC to provide the desired production of about 4500 officers from Class Year 1969. Also, for this reason, it is estimated that a 35+ percent ratio between Category I-P and total graduates (1600-4500) will be maintained in 1969.

Therefore, based on actual POC attrition of 8.25 and 10.33 percent experienced for the classes of 1967 and 1968, respectively, and the projected rate of 7.71 for FY 1969 (i.e., from attrition rates derived from column 4, Table 15), the use of a 10 percent rate for attrition during POC seems reasonable.

Number of Pilot Candidates Graduating and Entering UPT

Table 16 shows differences, by class year 1965 through 1968, in accession to UPT of Category I-P ROTC graduates. The shortfalls are due almost exclusively to net differences between the numbers entering and completing postgraduate study.*

If based solely on the historical record above, future year accession attrition rates of from six to nine percent could be estimated. It is suggested, however, that accession attrition be ignored in estimates of

*Most, but not all, graduates come on active duty, i.e., enter undergraduate pilot (or navigator) training or are assigned to an active duty unit, within one year after commissioning. A delay may be approved under AFR 45-31, Delay in Active Duty for AFROTC, (5 February 1968), for cadets who indicate an intention to apply for a delay in order to undertake AFIT (Air Force Institute of Technology) or other advanced study. The Air Reserve Personnel Center will not forecast a cadet for active duty from his graduating class if he has indicated an intention to apply for an educational delay. (AFROTC Manual 45-1, Administration of Senior Air Force Cadets, 31 March 1966, as amended.)

Table 16

UPT ACCESSION ATTRITION

Class of	Category I-P Graduates	Entering UPT		Percent Attrition
		Number	Percent	
1963	1181	1102	93.31	6.29
1964	1322	1215	91.91	8.09
1965	1496	1358	90.78	9.22
1966	1577	1555	98.60	1.30
1967	1914	1799	93.99	6.01
1968	1777	1677	94.37	5.63

[a]Data derived from Appendix H.

future year production and costs. First, the expectation is that any past significance of UPT accession attrition will be eliminated as an estimating factor because ROTC programmed graduate output has been leveled off at about 4500 graduates for fiscal years 1969 through 1973, and, consequently, educational delay completions should soon, nearly if not exactly, offset educational delay starts. Second, in the unlikely event that this does not prove to be true, the ratio between accession attritions and total graduates would still be very small (less than one percent).

Consequently, it is considered that no adjustment for accession attrition need be made in the use of a 10 percent factor (derived from Table 16) for estimating attrition between POC enrollment and ROTC graduation, and UPT enrollment.

ROTC PILOT CANDIDATE PRODUCTION COSTS

The two major categories of ROTC pilot candidate costs--the program costs of graduation and the costs of flight instruction for POC category I-P (pilot category) students--are discussed in some detail below. A third ROTC cost is for the permanent change of station (PCS) movement of pilot candidates to UPT bases upon graduation. As explained in the footnote on page 3, the Air Force currently uses $710 as its estimate of the average cost of these PCS moves.

Composition of ROTC Personnel Resources

These resources consist of professors of aerospace studies and their detachment staffs. In fiscal years 1966 and 1967, the programmed year-end strengths were 1756 and 1708, respectively. Commencing with FY 1968 and extending through FY 1973, the programmed strength is 1756 (967 officers, 765 airmen, and 24 civilians).*

The assigned strength of Headquarters ROTC and the detachments is indicated in Table 17. Detachments, on the average, consist of eight military personnel. All civilians are employed in Headquarters ROTC.

Table 17

ASSIGNED STRENGTH OF HEADQUARTERS ROTC AND DETACHMENTS

Fiscal Year[a]	Officers	Airmen	Civilians	Total
1964	964	773	26	1763
1965	970	781	23	1774
1966	892	753	22	1667
1967	880	723	27	1630
1968	815	678	28	1521

SOURCE: Air University, Monthly Personnel Statistical Summary, RCS:DPC-85.

[a]Ending March 31.

Adjustments for Inconsistencies in Reporting by Fiscal Year. Some ROTC program costs are incurred in one fiscal year, but allocated to the costs of a different fiscal year. For example, field training, conducted in June, July, and August, involves two fiscal years. In cases such as this, costs and activity rates have been adjusted to explain the costs in a given fiscal year. The adjustment methodology is explained in each case.

Military Pay. For the reason stated in the previous paragraph, the military pay costs in Appendix I do not relate meaningfully to the numbers of enrollees, graduates, or permanent party military personnel.

*Assigned strengths may lag or exceed authorized strengths temporarily but the long-term authorization is 1756.

Accordingly, military pay was reconstructed for five years as follows:

(1) Average monthly rates of pay for each grade and rank were obtained for each year from Air Force Manual 177-105. From data in the AFROTC-P44 report, it was determined that approximately 60 percent of ROTC permanent party officer personnel were on flying status in FY 1968. This percentage was adopted as a factor for all five years.

(2) The number of permanent party personnel listed in Table 17 was broken down into grades proportionate to the number in each grade in FY 1968. Average monthly rates of pay for each grade appropriate to the fiscal year were multiplied by the number in each grade, rated (60 percent) and nonrated (40 percent).

In Table 18, the computed amounts are compared with the reported amounts.

Table 18

ROTC MILITARY PAY AND ALLOWANCES

Fiscal Year	Computed	Reported[a]	Difference
1964	$13,150,956	$14,628,596	+ $1,477,640
1965	16,133,820	14,893,333	- 1,240,487
1966	15,939,936	14,432,754	- 1,507,182
1967	18,371,460	17,944,972	- 426,488
1968	18,677,196	19,201,795	+ 625,599
Total	$82,273,368	$81,202,450	- $1,070,918

[a]Data shown in this column were obtained from a special report prepared by Headquarters ROTC for use in this study. The distribution of costs by the cost elements within the Operation and Maintenance (O&M) and Reserve Personnel (RP) Appropriations and by the indirect expense categories displayed in Appendix J was derived from this special report. The data shown in Appendix J have been adjusted (redistributed) to take into account certain differences in expense recording and allocation procedures that existed between Headquarters ROTC and Air University prior to FY 1967.

The close approximation of the computed amount of military pay with the reported amount, when both are summed for five years, lends confidence in the use of the computed numbers. Accordingly, the computed military pay

costs, shown in Table 18, were used in taking into account pay raises and longevity step increases prior to 30 June 1968, that is, in making the adjustments to FY 1968 dollars shown in Appendix K.

The number of military personnel assigned to ROTC during FY 1964-1968, listed in Table 17, was regressed against adjusted military pay in Appendix K. The data points are repeated for convenience in Table 19.

Table 19

ROTC MILITARY PERSONNEL ASSIGNED AND MILITARY PAY

Fiscal Year	Personnel Assigned	Military Pay and Allowances
1964	1737	$21,214,333
1965	1751	21,367,470
1966	1645	19,887,142
1967	1603	19,357,273
1968	1493	18,677,196

The resulting estimating equation for military pay is: Y = $12,208.9 x number of military personnel assigned to ROTC.

The number of military personnel assigned to ROTC was regressed against the total number of ROTC enrollments, listed in Table 14. The estimating equation for number of military personnel required to man the ROTC program is: Y = 1,193.01183 x .0055 x number of ROTC enrollments.

It is apparent that the number of military personnel required to man the ROTC program is related to enrollments. Total enrollments, however, are not related to number of graduates or to numbers entering the POC. Furthermore, the very small increment of 5.5 additional military personnel for each additional 1000 enrollments shows that a large portion of the military strength of the Headquarters ROTC and detachments is relatively fixed and that a change in total enrollments, either up or down, must be substantial before a significant change in ROTC manning is required.

Cadet Pay. Cadet pay also shows a bothersome lack of relationship to numbers of POC cadets. Cadets in the first two years (GMC) are not

entitled to pay, except for those receiving scholarships through the Financial Assistance Program (FAP). The difficulties arise because of changes in the cadet pay rates through the years and differing groups of cadets entitled to cadet pay. An adjustment was made in cadet pay to take into account these factors, as follows:

(a) Cadet pay over the years is always correlated to the pay per day authorized. Pay was therefore reduced to days. Table 20 gives the cadet pay rates for FY 1964-1968.

Table 20

ROTC CADET PAY RATES FOR FISCAL YEARS 1964-1968

Fiscal Year	Pay Per Month		Pay Per Day	
	FAP	Non-FAP	FAP	Non-FAP
1964	---	$27	---	$0.90
1965	---	40	---	1.33
1966	$50	40	$1.67	1.33
1967	50	40	1.67	1.33
1968	50	50	1.67	1.67

NOTE: The ROTC Vitalization Act of 1964, passed 13 October 1964, provided for $50 per month retainer pay for ROTC cadets in the Financial Assistance Program. The Secretary of the Air Force administratively raised the pay of Non-FAP ROTC cadets, effective in FY 1968, in accordance with authority in the Act of 1964.

(b) Total number of days and average number of days per cadet were determined for each fiscal year by dividing the total cadet pay by the pay per day applicable to the particular year and cadet category. Table 21 shows these data.

Cadet pay is subject to the same reporting confusion as military pay. Some of the cadet pay earned in one fiscal year is reported in another. Accordingly, the number of days per cadet was averaged as shown in Table 21.

(c) The last step in adjusting prior year's cadet pay to 1968 rates is to multiply the average of days per cadet by $1.67 (the pay that each cadet received per day in FY 1968), and multiply that figure by the number of cadets. The resulting total, shown in Table 22, becomes the adjusted cadet pay for each year.

Table 21

CADET PAY AND AVERAGE NUMBER OF DAYS PER CADET

	FY 1964	FY 1965	FY 1966	FY 1967	FY 1968	Average[a]
Enrollments						
FAP: Basic	---	---	---	---	586	
POC	---	---	968	1,914	2,477	
Non-FAP	13,664	14,481	12,982	12,305	9,184	
Cadet Pay[b]						
FAP	---	---	$ 450	$ 902	$1,328	
Non-FAP	$3,097	$4,228	$4,264	$3,603	$3,735	
Pay Per Day						
FAP	---	---	$1.67	$1.67	$1.67	
Non-FAP	$0.90	$1.33	$1.33	$1.33	$1.67	
Cadet Days[b]						
FAP	---	---	269	540	795	
Non-FAP	3,441	3,179	3,206	2,709	2,237	
Av Number Days Per Cadet						
FAP	---	---	278	282	260	273.3
Non-FAP	252	220	247	227	244	236.6

[a]Non-FAP cadet day average is lower than the FAP cadet day average because the non-FAP cadets have the higher attrition rate.

[b]In thousands (rounded).

Table 22

ADJUSTED CADET PAY BY FISCAL YEAR

Fiscal Year	FAP Cadets (1) Enrollments	FAP Cadets (2) Total Days[a] Col 1 x 273.4 (Av Days)	FAP Cadets (3) Total Pay[a] Col 2 x $1.67 (FY 68 Rate)	Non-FAP Cadets (4) Enrollments	Non-FAP Cadets (5) Total Days[a] Col 4 x 236.6 (Av Days)	Non-FAP Cadets (6) Total Pay[a] Col 5 x $1.67 (FY 68 Rate)	All Cadets (7) Total Pay[a] (Cols 3 + 5)
1964	---	---	---	13,644	3,233	$5,399	$5,399
1965	---	---	---	14,481	3,426	5,722	5,722
1966	968	265	$442	12,892	3,072	5,129	5,572
1967	1914	523	874	12,305	2 911	4,862	5,736
1968	3068	837	1398	9,184	2,173	3,629	5,027

[a]In thousands (rounded).

Field Training. Field training costs consist of temporary duty travel of detachment personnel, travel of cadets to and from field training, pay and subsistence of cadets while at field training, and uniform costs. For this study, cadet pay was adjusted as shown in subparagraph (a) and other costs were lumped and adjusted as explained in subparagraph (b).

(a) Cadet pay for field training was determined by subtracting cadet pay in Appendix H from cadet pay in Appendix I. Cadet pay in Appendix H consists solely of retainer pay, whereas in Appendix I it consists of both retainer and field training pay. Table 23 shows how the ROTC field training pay rates have changed over the years.

Table 23

CADET PAY AT ROTC FIELD TRAINING UNITS

Effective Fiscal Year	GMC Four-Week Field Training		POC Six-Week Field Training	
	Monthly	Daily	Monthly	Daily
1964	$111.15	$3.71	$78.00[a]	$2.60
1965	120.60	4.02	78.00	2.60
1966	147.30	4.91	87.90	2.93
1967	151.95	5.07	90.60	3.02
1968	160.50	5.35	95.70	3.19

[a]Field training payments to cadets attending six-week field training course is in addition to the $50 monthly on-campus allowance.

The majority of cadets attending field training are those who have taken the GMC and are about to enter POC. Those starting the two-year course attend the six-week field training course.

About 15 percent of those in field training are given the six-week course. Based on this, an index for adjusting field training pay to FY 1968 dollars was constructed as shown in Table 24.

(b) The estimates of field training costs, shown by fiscal year in Appendix I, were obtained by multiplying the total cadet pay for the year by the appropriate field training pay index factor shown in Table 24, and by adjusting non-personnel costs by the factor shown in Appendix E.

Table 24

ROTC FIELD TRAINING PAY INDEX

Fiscal Year	(1) Ratio: 6-Week vs. 4-Week Trainees (%)	(2) Daily Rates ($)	(3) Combined Daily Rate ($) (Col 1 x 2)	(4) Index[a]
1964[b]	100	3.71	3.7100	1.35471
1965	15	2.60	.3900	
	85	4.02	3.4170	
			3.8070	1.32091
1966	15	2.93	.4395	
	85	4.91	4.1735	
			4.6130	1.08952
1967	15	3.02	.4530	
	85	5.07	4.3095	
			4.7625	1.05532
1968	15	3.19	.4785	
	85	5.35	4.5475	
			5.0260	1.00000

[a]Index is obtained by dividing the FY 1968 combined daily rate ($5.0260) by that of each of the other fiscal years.

[b]In FY 1964, all cadets attended the four-week field training course. The separate two-year POC course (and attendant six-week field training course) were begun in FY 1965.

Program Costs for Graduates. The program cost for graduates has two components: one is the Financial Assistance Program (FAP) costs that consist of grants and book allowances (neither of which is received by other cadets), and pay that is received by FAP cadets but not by non-FAP cadets attending the first two years (GNC). The other component consists of program costs less FAP-peculiar costs. Program costs for graduates, in FY 1968 dollars, are based on data points from Appendix K, repeated for convenience in Table 25.

FAP-peculiar costs (FAG and book allowance) directly correlate with the number of FAP cadets. The estimating equation for adjusted costs is:

$$Y = \$861.54853 \times \text{number of FAP cadets.}$$

Table 25

DATA POINTS FOR ROTC GRADUATION COSTS AND COST PER GRADUATE

	FY 1964	FY 1965	FY 1966	FY 1967	FY 1968
Enrollments					
FAP: Basic					586
FAP: POC			968	1,914	2,477
Non-FAP: POC	13,664	14,481	12,982	12,305	9,184
FAP Costs[a]					
Financial Assistance Grants (FAG)			$737	$1,480	$2,302
Book allowance			77	149	214
			814	1,629	2,658
FAP pay			442	874	1,398
			1,255	2,503	3,814
Program Costs[a]	$33,268	$33,984	$33,499	$34,346	$33,701
Less FAG and book allowance	33,268	33,984	32,686	32,717	31,043
Less FAG, book allowance and FAP pay	33,268	33,984	32,244	31,843	29,887

[a]Costs in thousands of dollars (rounded).

FAP pay must be treated separately even though non-FAP cadets now receive the same rate of pay per month, i.e., $50 per month, because FAP cadets in the GMC course receive retainer pay while non-FAP cadets do not. The estimating equation for FAG, book allowance, and retainer pay is also directly related to the number of FAP cadets:

$$Y = \$1062.9 \times \text{number of FAP cadets.}$$

Program costs less FAG, book allowance, and FAP pay costs represent costs peculiarly related to FAP cadets. When these elements are subtracted from total costs, the remaining costs represent costs not related to special FAP requirements. When regressed against non-FAP POC cadets, the estimating equation is:

$$Y = \$22,758,335.40 + \$757.55149 \times \text{number of non-FAP cadets enrolled in POC.}$$

This procedure raises a question: What would be the effect of reducing the number of enrollments in the equation by the number of FAP cadets? Do not FAP cadets incur part of the costs of the other cost elements, i.e., should the other cost elements be reduced by some amount representing the costs of the FAP cadets? This point was tested with respect to military pay. First, total enrollments were reduced by FAP enrollments and the number of military permanent party personnel calculated, using the regression equation previously formulated Then, the permanent party costs were calculated using the military pay regression equation. The results are compared in Table 26.

Table 26

PERMANENT PARTY MILITARY PAY WITH AND WITHOUT FAP ENROLLMENTS

	FY 1966	FY 1967	FY 1968
With FAP Cadets			
Military pay	$20,083,641	$19,570,867	$18,227,888
Military personnel	1,645	1,603	1,493
Enrollments	78,691	72,257	57,700
Without FAP Cadets			
Military pay	$19,656,329	$19,290,062	$18,240,097
Military personnel	1,610	1,580	1,494
Enrollments (less FAP)	77,723	70,343	54,637
Difference in costs			
Difference in costs	-$427,312	-$280,805	+$_2,209

It is clear that the bulk of the military pay cost element is relatively fixed and that the effect of deleting FAP enrollments from the equation had only a very small impact upon military pay which constitutes nearly two-thirds of program costs. Use of the regression equation for program costs of non-FAP cadets enrolled in POC is therefore considered acceptable.

Table 27 compares program costs in Appendix K with those computed from the regression equations.

Table 27

COMPARISON OF ADJUSTED AND COMPUTED PROGRAM COSTS

(In $ thousands)

	FY 1964	FY 1965	FY 1966	FY 1967	FY 1968
Program costs from Appendix H	$33,268	$33,984	$33,499	$34,346	$33,701
Computed program costs:					
FAP enrollments			1,222	2,417	3,868
Non-FAP POC	33,120	33,728	32,593	32,080	29,716
Total program costs	$33,120	$33,728	$33,815	$34,497	$33,584

Program costs may now be related to number of FAP enrollees and number of non-FAP enrollees in POC; that is, total program costs may be estimated using the number of enrollees under the FAP program and the number of non-FAP enrollees in POC for various ranges of ROTC production.

The number of FAP cadets is a policy decision. In FY 1968, there were 3063 FAP students (586 in GMC and 2477 in POC). The program now calls for scholarships to be offered during the coming years, as indicated in Table 28.

Table 28

ROTC FAP SCHOLARSHIPS--PROJECTED

	FY 1969	FY 1970	FY 1971	FY 1972	FY 1973
Number of Scholarships	4000	4750	5500	5500	5500

SOURCE: Professional Education Division, Directorate of Personnel Training and Education, Hq USAF.

The first two scholarship increments (1000 each) were granted to POC cadets. The third 1000 scholarship increment was divided almost evenly between POC and GMC students. As shown in Table 28, scholarships are programmed to increase to 5500 in FY 1971 and to level off at that figure. On the assumption that the 2500 additional scholarships

will also be divided equally between POC and GMC students, the POC students will have about 3700 scholarships and the GMC students about 1800.

Table 29 shows estimated enrollments over a range of graduates. The estimates are worked backwards. Historically, the average third-year enrollment attrition rate has been about 10 percent. Therefore, third-year enrollments are estimated as the number of graduates divided by 0.9. Fourth-year enrollments are assumed to be approximately 1.04 times third year enrollments. The excess of fourth-year enrollments represents those who have not graduated because all academic or administrative requirements have not been completed. The number of fourth-year enrollees can vary considerably. The estimate of fourth-year enrollees as 1.04 times third-year enrollees accords with recent experience but may need re-estimation when more experience accumulates with the lowered POC attrition rate.

Table 29

ROTC ENROLLMENTS OVER A RANGE OF GRADUATES

Gradu-Gates	POC Enrollments		Total	POC (Less FAP/POC)	Enroll-ments	FIP[a] Graduates
	3d Year	4th Year				
3500	3889	4045	7,934	4,184	5500	1120
4000	4444	4622	9,066	5,316	5500	1280
4500	5000	5200	10,200	6,450	5500	1440
5000	5556	5778	11,334	7,584	5500	1600
5500	6111	6355	12,466	8,716	5500	1760
6000	6667	6934	13,601	9,851	5500	1920
6500	7222	7511	14,733	10,983	5500	2080

[a]FIP graduates are 32 percent.

Estimated program costs, in FY 1968 dollars, are based on the estimated enrollments shown in Table 29.

Table 30 shows program costs for graduates over a range. It should be noted that program costs for graduates are incurred over four years of an individual cadet's college career, and that costs are measured primarily in terms of cadets enrolled in POC which covers two years.

Table 30

ESTIMATED PROGRAM COSTS OVER A RANGE OF GRADUATES

(Without FIP Costs)

Graduates	FAP Costs	Other Costs	Program Costs	Average Cost Per Graduate
3500	$6,945,950	$25,927,930	$32,873,880	$9393
4000	6,945,950	26,785,772	33,731,722	8433
4500	6,945,950	27,644,542	34,590,492	7687
5000	6,945,950	28,503,606	35,449,556	7090
5500	6,945,950	29,361,154	36,307,104	6601
6000	6,945,950	30,220,975	37,166,925	6194
6500	6,945,950	31,010,343	37,956,293	5839

In a stable program, program costs for the fiscal year should about equal program costs for the number graduating that year. However, if abrupt changes are made in the number of graduates programmed for production, the program costs for graduates must be phased over two years in order to obtain annual program costs. For example, program costs for FY 1971 consist of the costs of FAP cadets enrolled in 1971 plus the costs of third-year enrollments of the class of 1972, less FAP third-year enrollments plus fourth-year enrollments of the class of 1971 less FAP fourth-year enrollments.

The estimating equation for the program costs of graduates, based on the data points in Table 30, is: Y = $26,927,188 + $1702.44 x number of graduates.

The equation for the program costs of graduates is based on the regression equations for FAP costs and for the costs of non-FAP POC enrollees. It is emphasized that the planned changes in the composition of the FAP program will change the equation.

A graph of the program cost curve for graduates is depicted in Fig. 2.

The picture of ROTC program costs that emerges from this analysis is this: A large segment of cost--e.g., military pay that constitutes nearly two-thirds of all program costs--is relatively inflexible to changes in

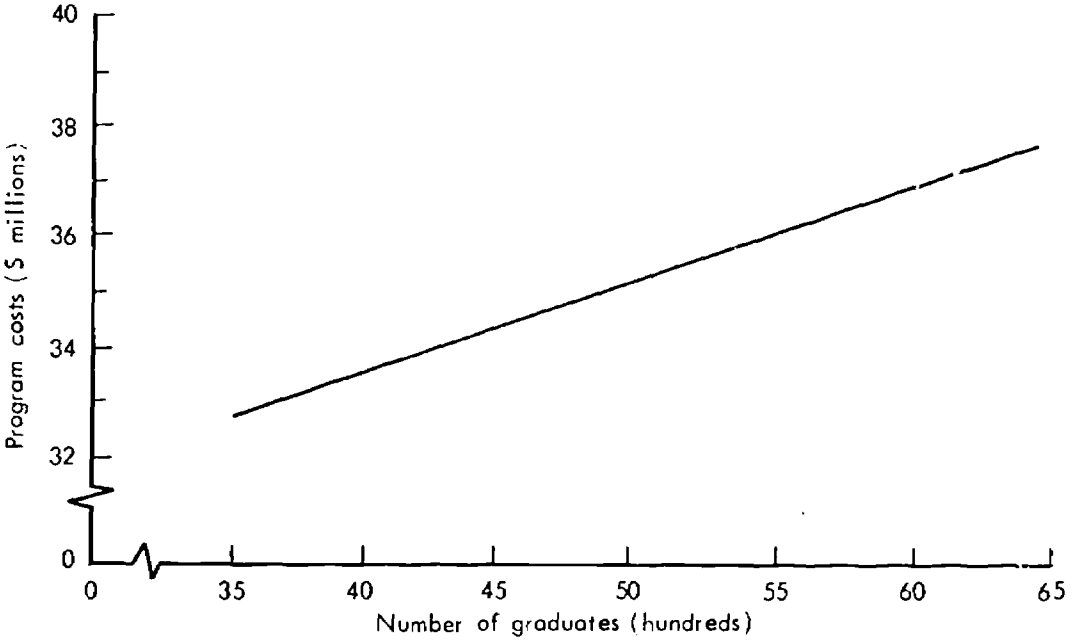

Fig. 2—Program costs of ROTC production by number of graduates

number of enrollments. On the other hand, several cost elements vary directly with the size of the POC enrollment and with the number of students receiving Financial Assistance Grants. The cost of the ROTC program is thus similar to the cost of AFA. There is a relatively fixed cost of operation, plus variable costs of about $3000 per graduate.

Flight Instruction Program Costs

Total costs and cost per ROTC graduate in Appendix H exclude Flight Instruction Program (FIP) costs because only about 32 percent of graduates incur FIP costs. As noted earlier, they are treated separately and applied only to the costs of Category I-P ROTC graduates.

The regression equation for FIP costs is based on total FIP costs as a function of the number of students successfully completing FIP. Table 31 shows the data points (see Appendix L) used to compute the FIP regression equation.

Table 31

FIP COSTS AND NUMBER OF SUCCESSFUL COMPLETIONS

(Costs Adjusted to FY 1968 Dollars)

Fiscal Year	No. Participating in FIP Training	Comple-tions	Percent not Completing FIP	I-P Gradu-ates	FIP Program Cost
1964	1813	1561	13.9	1322	$ 978,791
1965	2067	1717	16.9	1496	1,074,585
1966	1888	1616	14.4	1577	1,012,259
1967	1830	1541	15.8	1914	1,002,471
1968	1654	1462	11.6	1777	936,606
Total	9252	7897	14.6	8086	$5,004,712

Approximately 15 percent of FIP participants do not complete the full FIP program. About 10 percent are eliminated for inaptitude or for medical or academic shortcomings, or they elect to drop out. The remaining five (approximate) percent are granted flight training waivers but are carried in the ROTC records as FIP participants. Waivers are given to those who already possess valid flight certificates and to others who are desirable pilot candidates but whose academic load is too heavy to allow time for FIP training. More detailed data on eliminations and waivers are shown in Appendix J.

It will be noted from Table 31 that the number of I-Ps graduating each year does not match the number completing FIP training, but that when the five-year total of those completing FIP training is compared with the number of I-Ps graduating, the difference is only 2 percent. Carry-overs (those who have completed FIP training but have not completed all requirements for graduation) for whom the FIP flight training requirement is waived account for the yearly discrepancies. For purposes of estimating future costs, the number of I-Ps graduating is taken as equivalent to the number completing FIP training.

The equation for estimating program costs of FIP is based upon regressing FIP program costs (adjusted to FY 1968 dollars) against the number completing FIP training for each year from FY 1964 to FY 1968, from data points in Table 31.

Except for some very minor variable costs, the adjusted costs in Table 31 consist entirely of contractual costs. The Air Force does not bear any fixed FIP program costs because the program is contracted to independent civilian operators on a per-flying-hour (or per-cadet) basis. Consequently, the cost regression curve will pass through the origin, and the resulting equation is:

$$\text{FIP program costs} = \$633.41x,$$

where x is the number of I-Ps completing FIP training during the year.

V. OFFICER TRAINING SCHOOL PILOT CANDIDATE COSTS

THE OFFICER TRAINING SCHOOL PROGRAM

This section develops the costs of pilot candidates entering UPT from Officer Training School (OTS). OTS facilities and the instructors and staff are analyzed in order to develop factors and relationships for estimating the costs of OTS pilot candidates over a range of production.

Purpose of OTS

The purpose of OTS is to train selected college graduates (men and women) to meet the requirements of the regular Air Force, the Air National Guard, and the Air Force Reserve for newly commissioned officers, that is, second lieutenants. OTS replaced the Officer Candidate School (OCS) in 1963 and became the only commissioning avenue available to active duty enlisted personnel. It is the only source of Women in the Air Force (WAF) officers, and the only commissioning source for the Air National Guard and Inactive Reserve Forces.

Location and Resources

OTS, an activity of the Air Training Command (ATC) is located at Lackland Air Force Base, San Antonio, Texas. The portion of Lackland AFB known as the Medina Complex is the primary training and housing facility. The two key resources, physical facilities and instructors, are discussed in separate subsections.

Course Description

The OTS curriculum consists of 12 weeks (60 training days) of intensive study and training with emphasis on the professional military knowledge and abilities required of a commissioned officer.* The classes are seminar-type and are augmented by lectures and demonstrations. The course covers such subjects as Air Force basic tactical and defensive concepts, roles and functions of the major commands, principles

*Until 1967, all newly appointed Judge Advocates and Chaplains attended a separate OTS course for indoctrination in officer fundamentals.

of leadership, military publications and correspondence, public speaking, career orientation, military justice and court martial procedures, customs of the Service, and the world military situation. About one-third of the students' time is devoted to physical training, marksmanship, drills and ceremonies, and field training.

The OTS student organization is comparable to an Air Force wing, i.e., with three groups and three squadrons per group. A few students rotate in acting as squadron officers and all students as flight officers, and thus gain experience in commanding military formations and drills.

OTS TRAINEE SOURCES

There are three sources of OTS trainees; all are college graduates. The primary source is civilian graduates of civilian colleges who have majored in needed technical fields but who have had little or no prior military service. In these respects, OTS differs from OCS (its predecessor) which was NCO-oriented and which did not require a college degree.

The other two sources are enlisted personnel who enter OTS training either through the avenue of the Airman Education and Commissioning Program (AECP) or the Bootstrap Commissioning Program.

The AECP is a highly competitive Air Force-financed educational program. Its specific purpose is to enable enlisted personnel to meet the baccalaureate degree requirement for admission to OTS. Under the AECP, qualified career-motivated enlisted personnel who have a minimum of one year's service and 30 college-accredited semester hours (or 45 quarter hours) may be assigned to a civilian college or university to complete undergraduate work for a baccalaureate degree. Those selected attend college full time in military duty pay status, and the Air Force pays tuition fees and up to $100 in textbook allowances.

Operation "Bootstrap" has a broader purpose. It is designed to give airmen an opportunity to earn a college degree and, unlike AECP, is not limited to those who desire to qualify for OTS. It allows a

qualified and eligible career member of the Air Force on active duty to complete high school or college work in off-duty classes with the Air Force paying up to 75 percent of tuition costs. If the student requires only one year for his college degree, he may be assigned directly to the college of his choice and continue to receive full pay and allowances.

About 80 percent of the OTS student body enter the program directly from civilian life; about 11 percent are enlisted personnel with degrees acquired either through the Bootstrap program or before they enlisted, about one percent are WAF, and not quite one percent are Air National Guard and Inactive Reservists.*

OTS ENTRANCE REQUIREMENTS

Applicants must be college graduates of seniors approaching graduation; their grades must have been better than average, and they must meet physical standards and pass the Air Force Officer Qualification Test (AFOQT). They must be between the ages of 20-1/2 and 29-1/2, and must be commissioned before their 30th birthday. Men desirous of flying training must not be more than 26-1/2 at the time of application. Applicants must, of course, be of good character and Air Force career-motivated.

OTS STUDENT COMMITMENTS AND BENEFITS

All selected applicants enlist in the regular Air Force Reserve for four years as an E-1 (Airman Basic) or, if qualified, as an E-2 (Airman). Before entering OTS, the applicant must sign a formal acceptance of his assigned career field (pilot, navigator, or other specialty).

Upon entry and through OTS training, they are carried in pay grade E-5 (Staff Sergeant) at the current basic monthly rate of $254.70.

*Colonel Donald J. Ferris, "Texas Training Ground for USAF Leaders," Space Digest, March 1969. Colonel Ferris is Commander, USAF Officer Training School.

They receive an allowance for transportation from home to OTS. Uniforms and text books and all support requirements (billets, mess, medical services, etc.) are free.

OTS STUDENT QUOTAS

Because of the relatively short lead time for selection and training of officer candidates, the OTS output can be quickly increased or cut back (both in total and in the mix of rated and nonrated specialties) in response to changes in Air Force requirements. For this reason, ATC program planners adjust the OTS program to fill the gap between Academy and ROTC outputs and approved officer production (including UPT entrant) quotas.

To illustrate: The OTS new commission quota for FY 1969 was cut from 6535 to 3728 because of the voluntary and involuntary retention of many officers who had been scheduled for retirement, some reduction in nonrated officer requirements, and the planned overall decrease in officer strength.* Conversely, as shown in Table 32, OTS can quickly

Table 32

OTS PRODUCTION

Fiscal Year	Candidates Entering			Candidates Graduating		Percent Attrition	
	Pilot (No.)	Pilot (%)	Other	Pilot	Other	Pilot	Other
1964	484	9.44	4,645	454	4,267	6.20	8.14
1965	527	13.12	3,491	440	3,142	16.51	10.00
1966	1248	42.78	1,669	1082	1,514	13.30	9.29
1967	1581	17.84	7,283	1393	6,353	11.89	12.77
1968	2225	32.14	4,706	1921	4,399	13.66	6.52
Total	6067	21.76	21,794	5290	19,675	12.81	9.73

SOURCE: Air Force Personnel Center (AFPMRDC), Lackland AFB, Texas.

*Rated spaces and spaces for enlisted personnel remained about the same: 2,354 were for civilian and enlisted applicants for pilot training; 208 were for navigator candidates. Quotas were also retained for 385 AECP, 225 WAF, and 200 Bootstrap personnel.

adjust to an increased demand for new officer production such as occurred in FY 1967. Table 32 also shows OTS flexibility as to class composition by type of candidate. There has been a planned progressive increase in the ratio that pilot candidate enrollments bear to the OTS total.

LEAD TIME FOR ADJUSTING OTS QUOTAS

About one-half year lead time is required for adjusting OTS production goals. For example, selections for OTS class 69-A, which entered training on May 16 and graduated on August 9, were made by a board convened on 12 March 1968.

MANAGEMENT OF THE OTS PROGRAM

The USAF Military Personnel Center, at Randolph Air Force Base, Texas, determines training and production quotas, class schedules,* extended active duty schedules, and OTS eligibility criteria. It assigns production quotas (limitations) and class schedules to the Chief of the National Guard Bureau (NGB) and to Headquarters, Air Force Reserve for AFR candidates.**

Civilians are recruited, chiefly from colleges, by the USAF Recruiting Service (ATC). Airmen obtain applications and their preliminary processing from Consolidated Base Personnel Offices.

Four selection boards are appointed to review OTS applications and make selections. Lackland Military Training Center (ATC) convenes the board for male USAF applicants, the Hq USAF Recruiting Service for WAFs, and the NGB and Hq Air Force Reserve for their respective applicants. All selectees are assigned to training classes by Lackland Military Training Center.

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*Eight 12-week classes are normally scheduled each fiscal year. In FY 1967, OTS conducted 10 classes of 10 weeks each in order to meet a production goal of nearly 8000 graduates.

**Air Force Regulation No. 53-27, USAF Officer Training School (OTS), 6 February 1967.

The conduct of the training and provision of student accommodations (billets, mess, etc.) are the responsibility of the Lackland Military Center

ATTRITION DURING OTS

From the last two columns of Table 32, it was seen that over the five-year period, FY 1964 through FY 1968, candidates for pilot training have had a higher attrition rate than other OTS enrollees. One probable reason is that admission of non-pilot applicants is more highly selective than for pilot candidates because of the greater number from which to choose. The majority of the 30,000 who apply for OTS each year do not want to be pilots. Another conjectural reason is that, on the average, non-pilot applicants are older and many have had NCO experience.

For its production planning, the Lackland Military Training Center uses a 12 percent attrition rate for all categories of OTS students.

PILOT CANDIDATE ATTRITION BETWEEN OTS GRADUATION AND ENTRY INTO UPT

Table 33 shows the number of pilot candidates graduating from OTS in fiscal years 1964 through 1968, and the number who entered UPT in the year following graduation.

Table 33

PILOT CANDIDATE OTS GRADUATES VERSUS UPT ENTRANTS

Pilot Candidates Graduating from OTS		UPT Entrants	
Fiscal Year	Number	Fiscal Year	Number
1964	454	1965	480
1965	440	1966	433
1966	1082	1967	1018
1967	1393	1968	1291
1968	1921	1969	2364
Total	5290		5586

SOURCE: Directorate of Personnel Planning, Headquarters, USAF

It is difficult to match the flow from OTS graduation to UPT entry because of fiscal year accounting. An applicant for pilot training may enter OTS, graduate and enter UPT in the same year or the next fiscal year, depending upon when his OTS class commences. However, there is a close match, in the aggregate, between pilot candidate OTS graduates and following-year UPT entrants and, for this reason, no factor is considered necessary for such small attrition as may occur between OTS graduation and entry into UPT.

MAXIMUM PRODUCTION CAPACITY AS DETERMINED BY FACILITIES AVAILABILITY

As has been explained, OTS output may be increased rapidly because training is accomplished in 12 weeks. The output may be further accelerated by scheduling ten 10-week classes per year as was done in FY 1967. Moreover, the pool of applicants (about 30,000 annually) is adequate for any foreseeable level of production. For these reasons, the upper limit on OTS output is dependent upon availability of the two key resources needed for training: instructors and physical facilities. This subsection considers the latter.

The Lackland Air Force Base Medina Complex is the primary facility for housing and training OTS trainees. It has a current capacity to accommodate 958 students under criteria revised by AFM 30-7, 1 August 1967, or 1322 students in an overload situation such as existed under the previous billeting criterion.

Student Load and Load Changes

Student load is the average of month-end strengths (enrollments) throughout the fiscal year. Load change is defined as the number of times the student body, which comprises the student load, changes in a year. OTS now schedules eight 12-week classes a year. Entry is on a 6-week cycle, and because two classes are in training at the same time, there are four, rather than eight, load changes yearly.

If there were four 12-week classes, there would also be four load changes but the student load would be halved. If the class length were cut to ten weeks, with entries every five weeks (as in FY 1967), ten

classes could be squeezed into a year. With five load changes, the student strength would then be increased 125 percent, that is, by five-fourths.

Production Capabilities Based on Available Housing

In Table 34, maximum student load is taken to be synonymous with the number of billet spaces available. This availability is contingent upon Congressional appropriations for construction of dormitory and related academic and messing facilities requested or to be requested for the Medina complex. The data in this chart presuppose that Congressional approval will be obtained, and that construction will be completed two years thereafter.

Table 34

MAXIMUM STUDENT LOAD AND PRODUCTION
AS A FUNCTION OF BILLET AVAILABILITY

	FY 1969	FY 1971	FY 1972	FY 1973
Current Billeting Criteria				
Maximum student load	958	1038	1468	1700
Total students	3832	4152	5872	6860
OTS graduates[a]	3372	3654	5167	5984
UPT candidates	2192	2375	3359	3890
Former Billeting Criteria				
Maximum student load[b]	1322	1402	1832	2064
Total students	5288	5608	7328	8256
OTS graduates[a]	4653	4936	6449	7265
UPT candidates	3024	3208	4192	4722

[a]Computed using Lackland's 12% attrition planning rate.

[b]The OTS student load was 1685 in FY 1967 and 1750 in FY 1968. The overflow from Medina was absorbed by Lackland AFB, proper. Commencing in FY 1970, this will not be possible because of mission changes.

The production data shown in Table 34 is based on a 12-week class schedule with four load changes each fiscal year; thus, for example, a student load of 2064 in FY 1973 would consist of 8256 students (entries) if billeting were under the former criteria. With an overall attrition rate of 12 percent, the projected number of OTS graduates

would be 7256. From this it follows that, in the overload billeting situation, if about 65 percent of the OTS production (graduates) were allotted to pilot candidates, OTS would produce about 4722 candidates for UPT. Under the current billeting criteria, this number would be reduced to about 3890.

This analysis answers the question: How many OTS graduates and UPT candidates can be produced from a given student load? It also demonstrates that the upper limit on OTS student loads is the number of billet spaces available to OTS students.

From the foregoing, a converse estimate may be made to project the average student load required for a given production, for example, to estimate the number of trainees that must be entered in OTS to produce, say, 7000 graduates. Given an attrition rate of 12 percent, the simple algebraic equation is: Desired production = input - attrition. Substituting, this gives a required input of 7000/.88 = 7955 to produce 7000 graduates. Dividing the number of entries (7955) by four load changes a year gives an average student load of 1989.

In summary, it is reasonable to consider 3890 as a pilot candidate ceiling for a maximum student load of 1700, and 4722 as a ceiling in the overload configuration of 2064 student load.

OTS STAFF AND SUPPORT REQUIREMENTS

This subsection estimates the manpower needed over a range of OTS production. This manpower consists of two components: OTS instructors and staff (direct support), and base support (indirect).

OTS Instructors and Staff

Manpower needs for various levels of production are determined in practice by applying manpower standards to OTS work centers. Individual manpower standards have been developed for nine OTS work centers, in accordance with Air Force Manual 25-5, Management Engineering Procedures, 7 June 1968.

Most of these standards are used to determine instructor-staffing needs at different student load levels. Others are applied to workloads that are relatively stable: For example, the workload factor for

the Curriculum Branch is the number of OTS courses offered and for the Scheduling Branch it is the average number of training hours scheduled per month. Other standards are based upon the number of authorized permanent party personnel in OTS.

A more aggregated approach has been used in this paper to estimate manpower needs of OTS. The workload is considered in two parts: that which varies with the average number of students in training, and that which is more stable and does not change directly with the number of students. Table 35 shows the number of instructors for varying student loads over 11 quarters of fiscal years 1962 to 1965.

Table 35

OTS INSTRUCTORS AND STUDENT LOADS

Fiscal Quarter	Student Load	Instructors	Fiscal Quarter	Student Load	Instructors
2/62	266	39	4/63	1786	200
3/62	266	39	1/64	1786	200
4/62	538	78	3/64	1435	162
1/63	1196	175	4/64	1276	133
2/63	1250	140	1/65	1276	133
3/63	1306	160			

SOURCE: Directorate of Manpower and Organization, Headquarters USAF.

The regression equation for the number of instructors required for a given student load, based on the data in Table 35, is:

$$\text{Number of instructors} = 15.7 + (.104 \times \text{student load}).$$

This equation has a correlation of .97 with a standard error of the estimate of 14.5. This variable is found only in the officer strength because instruction is given mainly by officers. Past records show that airmen and civilian authorizations (which are for the administrative staff) have remained stable within one or two spaces.(i.e., 28-30 airmen and 27-28 civilians) over a wide range of OTS production. Using

an average annual production of 3633, the number of manpower authorizations derived from the regression equation is 179.

Base Support Requirements. Lackland Air Force Base conducts a number of courses* besides officer training, and base support manpower is allocated to each course based on the proportion that its student load (expressed in student-weeks) bears to the total student load of all courses.

A USAF study** of Lackland AFB workloads and manning showed that a large proportion of permanent party manpower requirements is fairly constant and that additions are quite modest, that is, something on the order of 3.4 permanent party spaces per 100 additional student entries.

Since base support allocated to OTS is dependent upon the number of students in OTS versus the number in all courses at Lackland, and since courses and schedules change frequently, it is not possible to provide a consistent estimating OTS production. As a very generalized indication, however, the number of manpower equivalents of base support allocated to OTS would approximate the manpower strength of OTS in the lower ranges of OTS production. In the upper ranges, the proportion of base support is smaller.

As a very broad average, base support manpower equivalents amount to approximately 75 percent of OTS permanent party manpower.

COST PER STUDENT-WEEK

Table 36 displays student-week and program cost information developed in Appendix M. These data are also shown in a scatter diagram in Fig. 3 and, as was the case with similar data from AFA, a strong correlation is evident. In addition, approximately 65 percent of the loading spectrum (from zero to 90,000 student-weeks) per year is enclosed by the data, which enhances the credibility of any relationship that can be developed.

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*For example, Marksmanship, Cryptographic Maintenance, Security Police, Sentry Dog, Recruiting, Technical School Instructor, Operations Instructor, and Basic Military Training.

**AFOMODR Study No. 3, Program Factors Development Study, "Training Factor."

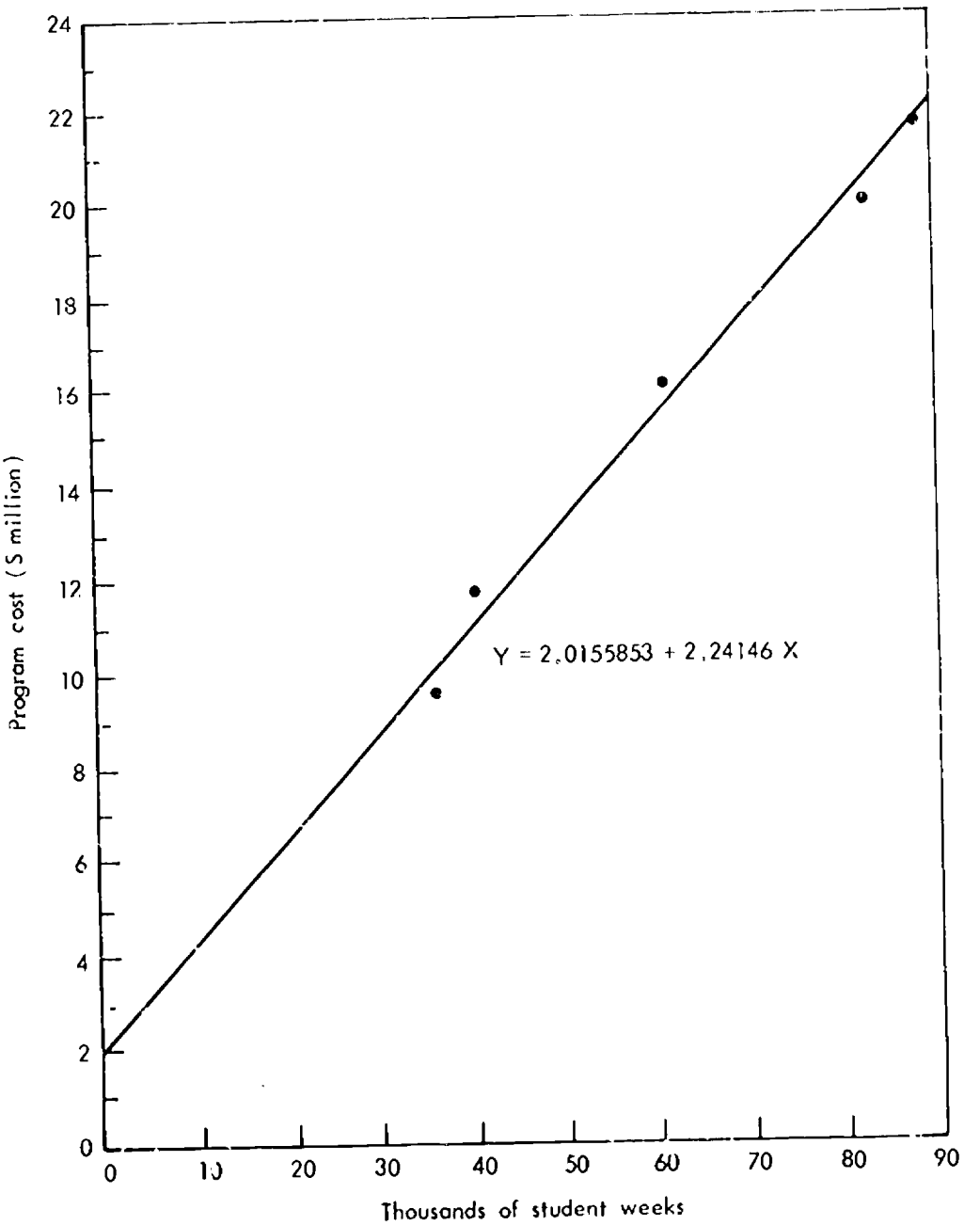

Fig. 3—Officer training school program costs versus loading

Table 36

OTS LOADING AND PROGRAM COST INFORMATION

Fiscal Year	Student Weeks	Cost Per[a] Student-Week	Program Cost
1964	60,839	$263.39	$16,024,384
1965	40,993	285.50	11,703,502
1966	36,439	262.02	9,547,747
1967	88,232	245.92	21,698,013
1968	82,067	246.98	20,268,908

[a]Adjusted costs from Appendix N.

Choice of the form of the relationship is important and should be such that the intercept of the Y axis (representing the fixed annual operating costs of the program) occurs at a value greater than zero.

Figure 3 illustrates a linear relation between the variables.that The fixed costs indicated are low in proportion to the current size of the program, and are so small that attempts to fit common curvilinear equations to the data produce intercepts with the Y axis that are less than zero.

It may be concluded from Fig. 3 that the fixed costs of the program are about $2 million. One reason for this low value is that OTS is one among a number of operations at Lackland AFB, and each is charged for indirect support and command overhead costs in proportion to its size.

The $224 marginal cost of additional student-weeks is constant over the range of loading examined, and is not widely different from the average costs of $245 to $285 quoted in the raw data. The course length is normally 12 weeks, which means that the marginal cost of a graduate is $2690. This is only about 9 to 10 percent of the marginal cost of an AFA graduate, but about 90 percent of the marginal cost of an ROTC graduate.

Appendix A

AFA ATTRITION DATA

Table A-1

ATTRITION SUMMARY BY FISCAL YEAR

Fiscal Year	Started	Completed	Attrition Number	Attrition %
1959	1164	1042	122	10.48
1960	1573	1365	208	13.22
1961	1907	1653	254	13.32
1962	2230	2034	196	8.78
1963	2497	2247	250	10.01
1964	2607	2286	321	12.31
1965	2788	2313	475	17.03
1966	2859	2574	285	9.96
1967	3140	2775	365	11.62
1968	3283	2929	354	10.78
Total	24,248	21,428	2820	11.63

Table A-1 shows that the highest rate of attrition occurred in fiscal year 1965. Attrition rates of all four class years are inflated for FY 1965 due to honor violations. Similar violations occurred among second classmen and third classmen during FY 1967. For this reason, the class-year attrition rates shown in Tables 4 and 5, pages 13 and 14, were adjusted by eliminating the data for the periods during which the violations occurred.

Table A-2 shows the application of these adjusted rates to a hypothetical entering class of 1000 cadets.

Table A-2

ADJUSTED ATTRITION RATE APPLIED TO HYPOTHETICAL ENTERING CLASS OF 1000 CADETS

	Adjusted Attrition Rate (%)	Completions Based on 1000 Entries
Fourth Classmen	19.4	804
Third Classmen	8.0	740
Second Classmen	6.6	691
First Classmen	2.1	676 (Graduates)
Class attrition	32.4	

Appendix B

AFA PILOT CANDIDATE PROJECTIONS

Application of the adjusted attrition rates (shown in Table A-4, Appendix A*) to classes that have not yet graduated gives an indication of the approximate number who may be expected to graduate. From this, the number of pilot candidates (70 percent of AFA graduates) may be estimated.

Table B-1

PROJECTED NUMBER OF PILOT CANDIDATES BY CLASS YEAR

	Class of				
	1969	1970	1971	1972	1973
Start Fourth Class	1054[a]	1034[a]	1033[a]	1250[a]	1360
Start Third Class	853[a]	873[a]	843[a]	1007	1096
Start Second Class	757[a]	790[a]	776	926	1008
Start First Class	690[a]	738	725	865	941
Graduates	679[a]	723	710	847	921
Estimates of pilot candidates as 70% of graduates	473	506	497	593	645

[a]Actual.

These projections are specific numbers based on average attrition rates. The number of AFA cadets who will actually graduate may deviate as much as 10 percent above or below the point estimates.

*Adjusted average attrition rates:

Fourth Classmen	19.4%
Third Classmen	8.0%
Second Classmen	6.6%
First Classmen	2.1%

Appendix C

Table C-1

ACTUAL AND PROJECTED AFA PILOT CANDIDATE FLOWS

FY and Class of	AFA Graduates				Accessions[d]	Undergraduate Pilot Training Program							Fiscal Year
	Entered[a] (FY - 4)	Total	P/Q[b]	P/C[c]		Entered[e] (FY + 1)	Attrition Total	Attrition cent	Pilot Production[f] AFA	USMA	USNA	Total	
1959	289	207	---	---	205	---	---	---	---	---	---	---	1960
1960	309	227	---	188	218	---	---	---	163	18	37	218	1961
1961	302	217	---	180	316	192	31	16.14	161	12	11	184	1962
1962	458	298	---	252	430	186	22	11.82	164	12	15	191	1963
1963	727	499	445	398	592	260	38	14.61	222	8	12	242	1964
1964	780	499	440	388	554	387	40	10.33	347	15	6	368	1965
1965	801	517	401	352	589	366	30	8.19	336	9	2	347	1966
1966	761	469	334	298	484	353	59	16.71	294	14	6	314	1967
1967	853	524	360	298	540	295	39	13.22	249	---	7	256	1968
1968	1011	612	448	430	---	---	---	---	---	---	---	---	1969
1969	1054	676	493	473	---	---	---	---	---	---	---	---	1970
1970	1034	723	528	506	---	---	---	---	---	---	---	---	1971
1971	1033	710	518	497	---	---	---	---	---	---	---	---	1972
1972	1250	847	618	593	---	---	---	---	---	---	---	---	1973
1973	1360	921	672	645	---	---	---	---	---	---	---	---	1974

[a] Net of turnback losses and gains.

[b] P/Q = Pilot Qualified.

[c] P/C = Pilot Candidates. Data from AFA records and include those initially assigned to UPT plus those who received Master's Degree Program and then assigned to UPT; exclude those who received scholarships or attended the regular AFIT program and then entered UPT.

[d] Accessions = Graduates Commissioned. Data from USAF Statistical Digest. Data do not match number of graduates because of fiscal year accounting for accessions and because accessions include graduates of USMA and USNA commissioned in USAF.

[e] Data provided by the Air Force Personnel Center. Note that fiscal year changes at this point; for example, the Class of 1966 graduates in June 1966 (FY 1966) and enters UPT in July, August, or September (FY 1967)

[f] Computed, estimated, or programmed.

[g] Actual through FY 1967, then projected. Data from AFDP.

APPENDIX D

Table D-1

AFA PROGRAM ELEMENT (8 11 15 00 F) COSTS BY APPROPRIATION AND COST ELEMENT

($ million)

	FY 1966	FY 1967	FY 1968	FY 1969	FY 1970	FY 1971	FY 1972	FYZ 1973
APPROPRIATION								
3010 Aircraft Procurement[a]	---	---	---	.115	.465	.460	.465	.464
Replenishment spares	.202	.186	.228	---	---	---	---	---
3080 Other Procurement								
Vehicular equipment[a]	.400	.400	.300	.300	.400	.400	.400	.400
Vehicular equipment	.100	.100	.100	---	---	---	---	---
Total other procurement	.500	.500	.400	.300	.400	.400	.400	.400
3300 Military Construction[a]	14.750	10.500	3.796	1.175	1.657	.937	.970	1.200
3400 O&M								
POL	.294	.560	.564	.623	.623	.623	.623	.623
Depot maintenance	.163	.344	.319	.612	.612	.612	.612	.612
Civilian personnel	11.107	11.585	12.150	12.602	13.976	14.691	14.691	14.691
Other supplies	---	.211	---	.076	.076	.076	.076	7.368
Leased communications	---	---	.082	.099	.099	.099	.099	.099
EPD rentals	.030	.031	.022	.089	.189	.189	.189	---
Installation supplies	1.931	1.931	1.934	1.934	1.934	1.934	1.934	---
Special Programs	4.296	5.352	6.809	7.284	5.169	5.169	5.169	---
Total O&M	17.821	20.014	21.880	23.328	22.678	23.393	23.393	23.393
3500 Military Personnel								
Pay and allowance								
Officers	7.402	8.079	9.051	10.021	10.492	11.244	11.254	11.268
Airmen	3.689	3.905	4.117	4.313	4.188	4.469	4.476	4.479
Cadets	6.100	7.378	8.174	8.800	9.489	10.049	10.592	10.871
Total military pay	17.191	19.362	21.342	23.134	24.169	25.762	26.322	26.618
Total Obligating Authority	50.464	50.562	47.646	48.052	49.370	50.952	51.550	52.075
Retirement Pay								
Retirement pay: officers	1.272	1.222	1.520	1.676	1.901	2.034	2.035	2.031
airmen	.633	.603	.569	.581	.628	.662	.660	.663
Total	1.905	1.825	2.089	2.257	2.529	2.696	2.695	2.694
Total PE cost	52.369	52.387	49.735	50.309	51.899	53.648	54.245	54.769

SOURCE: USAF Force and Financial Program, 2 January 1968.

[a]Indicates investment costs; all others are operating costs.

Appendix E

FACTORS FOR ADJUSTING PRIOR YEARS' COSTS TO FY 1968 DOLLARS

In order to adjust prior years' costs, it is necessary to take account of changes that have occurred in each year and to apply a factor which will convert prior years' costs of military personnel, civilian personnel, and nonpersonnel costs to FY 1968 dollar equivalents. The conversion factors are tabulated in Table E-1. These factors are applicable to all three officer sources, AFA, ROTC, and OTS.

BASIS OF FACTORS

Factors for adjusting military and civilian pay for FY 1956 through FY 1965 were based on pay increases approved by Congress, as related to effective dates of changes of rates used in preparation of C-107 report summaries. Fiscal year 1966 adjustments to military pay were based on AFM-177-101 rates, as applicable to the mix of officer and airmen personnel. The FY 1966 and FY 1967 civilian personnel adjustment factors are based on an estimated effect of the 1966 civilian pay increase and wage board increases. Factors for adjusting prior years' costs are reviewed quarterly and adjusted, as appropriate, to include pay increases for military personnel, GS civilian personnel, and WB employees. Factors for adjusting nonpersonnel costs are based on the government's Bureau of Labor statistics cost of living index.

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*Source: ATC Cost Factors Summary.

Table E-1

FACTORS FOR ADJUSTING PRIOR YEARS' COSTS TO FY 1968 DOLLARS

Fiscal Year	Military Personnel Cost	Civilian Personnel Cost	Non-Personnel Cost
	Military and Technical Training		
1956	1.9019	1.4621	1.2298
1957	1.8389	1.4621	1.1888
1958	1.7999	1.3931	1.1578
1959	1.6689	1.3301	1.1488
1960	1.6179	1.2581	1.1318
1961	1.5759	1.2361	1.1198
1962	1.5629	1.2361	1.1078
1963	1.5999	1.1991	1.0934
1964	1.5599	1.1611	1.0808
1965	1.3549	1.0941	1.0628
1966	1.2719	1.0621	1.0438
1967	1.0319	1.0231	1.0248
1968	1.0000	1.0000	1.0000
	Flying Training		
1961	1.6178	1.2361	1.1198
1962	1.6118	1.2361	1.1078
1963	1.6108	1.1991	1.0938
1964	1.5648	1.1611	1.0808
1965	1.3078	1.0941	1.0628
1966	1.2368	1.0621	1.0438
1967	1.0278	1.0231	1.0248
1968	1.0000	1.0000	1.0000

Appendix F

AIR FORCE ACADEMY COSTS

Table F-1

AFA CADET MAN-YEARS, GRADUATES, AND TOTAL COSTS BY FISCAL YEAR

Fiscal Year	Cadet Man-Years[a]	No. of Graduates[a]	Total Costs[a] ($ million)
1961	1653	254	$27.490
1962	2034	196	28.024
1963	2247	499	28.354
1964	2286	499	30.402
1965	2313	517	31.602
1966	2574	469	35.714
1967	2775	524	40.062
1968	2929	612	43.850
1969	3197	676	46.877
1970	3470	723	47.713
1971	3679	710	50.015
1972	3892	847	50.580
1973	3966	921	50.875

[a]Actual through FY 1968, projected for FY 1969-1973. Total costs for FY 1963-1965 were obtained from The President's Budget as reported by the Directorate of Personnel, Training and Education. Total cost for FY 1966-1973 came from the USAF Force and Financial Program (F&FP), 2 January 1968. Total costs for all years have been reduced by eliminating military construction costs. This was done because the Academy facilities expansion program was essentially complete by 1968 and the construction costs are considered sunk costs. This accounts for the difference between the total costs shown above and those shown in Appendix D.

Table F-2

AFA TOTAL COSTS ADJUSTED TO 1968 COSTS[a]

($ millions)

Fiscal Year	Civilian Pay			Military Pay			Nonpersonnel Costs			Total Adjusted ($)
	Actual ($)	Adj Factor	Adjusted ($)	Actual ($)	Adj Factor	Adjusted ($)	Actual ($)	Adj Factor	Adjusted ($)	
1973	14.691	0	14.691	26.618	0	26.618	9.566	0	9.566	---
1972	14.691	0	14.691	26.322	0	26.322	9.567	0	9.567	---
1971	14.691	0	14.691	25.762	0	25.762	9.562	0	9.562	---
1970	13.976	0	13.976	24.169	0	24.169	9.568	0	9.568	---
1969	12.602	0	12.602	23.134	0	23.134	11.141	0	11.141	---
1968	12.150	0	12.150	21.342	0	21.342	10.358	0	10.358	---
1967	11.585	1.0231	11.853	19.362	1.0319	19.980	9.115	1.0248	9.314	41.174
1966	11.107	1.0621	11.797	17.191	1.2719	21.865	7.416	1.0438	7.741	41.403
	(105.494)			(183.900)			(76.293)			
	(28.85%)			(50.29%)			(20.86%)			
1965	9.117	1.0941	9.975	15.893	1.3540	21.533	6.592	1.0628	7.006	38.514
1964	8.770	1.1611	10.183	15.289	1.5149	23.161	6.342	1.0808	6.854	40.198
1963	8.180	1.1991	9.809	14.259	1.5599	22.243	5.915	1.0934	6.467	38.519

[a]See Appendix E for listing and explanation of adjustment factors. The foregoing costs are based on budget estimates shown in the USAF Force and Financial Plan, 2 January 1968.

The cost data for FY 1966-1973 are available by cost element but those for FY 1963-1965 are available only in total. The percentage distribution of FY 1966-1973 dollars, by civilian pay, military pay and other than personnel expense categories, were therefore applied to the FY 1963-1965 totals to obtain an estimated breakout by these three expense categories. For example, the percentages were applied to the FY 1965 total (from Table E-1) to obtain estimates of $9.117, $15.893, and $6.592 for civilian pay, military pay, and nonpersonnel costs, respectively.

Appendix G

PILOT INDOCTRINATION PROGRAM (PIP)

Table G-1

AFA PIP FLOWS

Fiscal Year	Enter	Attrition	Complete PIP	Attrition Rate
1968	223	13	210	5.82
Summer	223	13	210	5.82
1969				
Summer	132	8	124	---
Fall	242	15	227	---
Spring	242	14	228	---
Total	616	37	579	6.00
1970				
Summer	132	8	124	---
Fall	248	15	233	---
Spring	248	15	233	---
Total	628	38	590	6.05
1971				
Summer	128	8	120	---
Fall	240	14	226	---
Spring	240	14	226	---
Total	608	36	572	5.92
Grand total	2075	124	1951	5.98

SOURCE: USAF Directorate of Training and Education.

Table G-2

AFA PIP PROGRAMMED COSTS
($ thousands)

	1968	1969	1970	1971	1972	1973
Appropriation						
O&M	98	143	143	143	143	143
Mil pers	127	276	300	324	325	325
Total	255	419	443	467	468	468

NOTE: Cadets completing PIP in this appendix are the number programmed in the Flying Training Program. This number differs from the estimates of the pilot candidates who will graduate from AFA as shown in Table 7. One set of PIP completions is a programming estimate, while the other is based on flow factors in this study.

Appendix H

ROTC PILOT CANDIDATE FLOWS

Table H-1

ROTC PILOT CANDIDATE FLOWS

Third Year (FOC) Enrollments		ROTC Production			Undergraduate Pilot Training		
31 Oct	Number	30 June	Total	Cat I-P	Fiscal[a] Year	Cat I-P Entering UPT	UPT Production
---	---	1963	3396	1181	1964	1102	877
---	---	1964	3962	1322	1965	1215	1034
1963	7333	1965	4506	1496	1966	1358	1090
1964	6917	1966	4790	1577	1967	1555	1240
1965	6426	1967	5896	1914	1968	1799	1439
1966	6366	1968	5708	1777	1969	1677	1326
1967	4876	1969	4696	1777	1550[b]	1550[b]	1240[b]

SOURCE: Third-Year Enrollments come from O-3 Report of Program Status; ROTC Production comes from O-3 Report and from USAF Directorate of Training and Education (AFPTR); ROTC Pilot Candidates Entering UPT also come from AFPTR; UPT Production comes from the Directorate of Personnel Planning (AFPDP).

[a]Fiscal year changes at this point. These fiscal year changes are confusing and must be matched with the appropriate prior step in the flow. For example, third-year enrollments occur in the fiscal year prior to the year of graduation. Graduation occurs (or is accounted for) in one fiscal year, and entry into UPT occurs the following fiscal year. UPT requires 53 weeks, and the flow may involve two fiscal years depending on the month of entry into UPT.

[b]Projected for 1970 production.

Appendix I

RESERVE OFFICER TRAINING CORPS COSTS

ROTC COSTING GROUND RULES

ROTC costing guidelines are contained in Air University Regulation 177-8, 24 June 1967. Annual costs are computed by expense elements, as shown in Table H-1, for the five years 1964-1968. All expense elements are operational costs.

Direct costs include expenses readily identifiable to a specific part of the ROTC program or to a detachment.

Indirect costs are the costs of resources consumed by Hq ROTC, and an allocated portion of the operating costs of Air University Headquarters, and AU supporting organizations. For example, the 3800th Air Base Wing supports the ROTC program and a portion of the payroll costs is allocated to ROTC costs.

Excluded costs are: Capital investment;* support by colleges; reimbursable logistical support provided to detachments by Air Force bases; PCS moving costs of permanent party personnel; and depreciation.

EXPENSE ELEMENTS

The expense elements shown in the ROTC cost report (Table H-1) are as follows:

Military pay covers total pay and allowances for officers and airmen on permanent assignment. Retirement pay is not included although it is included as part of programmed costs in the ROTC program element. Military pay and allowances are computed based on standard rates. Military pay is a variable cost because the size of detachments is related to the number of students.

Civilian pay covers pay and allowances for civilians in Headquarters ROTC only. No civilians are assigned to detachments. Civilian pay and allowances were carried under Indirect Costs until FY 1967 when they

*Host Institutions provide offices and classrooms, and Headquarters ROTC buildings and equipment are sunk costs.

were broken out as a separate item. Civilian pay is reported as actual obligations in the Air University ROTC Cost Reporting System, but it is programmed in the F&FP at a flat rate of $7500 per civilian manpower space. Civilian pay does not fluctuate with the number of cadets, and is therefore a fixed cost. ("Fixed" unless program changes, such as cha change in number of detachments, make a change in ROTC Headquarters workload.)

Cadet pay includes the $50 monthly pay of two- and four-year cadets enrolled in POC, and of cadets receiving Financial Assistance Grants. Cadet pay is allocated directly by detachment and is a variable cost.

Financial Assistance Grants cover the cost of tuition and fees for cadets selected for scholarships. This is a direct allocation supported by an institutional contract. The item also includes the travel of the scholarship cadet to his college. The cost is variable with the number of cadets receiving scholarships.

Field training covers all identifiable costs of operating field training, paid for by ROTC. This expense includes temporary duty travel of detachment personnel, travel of cadets to and from field training, pay and subsistence of cadets while in field training and field uniform costs. These total costs are prorated to each detachment based on the number of cadets participating in field training. Costs are variable with number of cadets taking field training.

Communications cover commercial charges of telephone and telegram communications of detachments and are a fixed cost.

Travel covers temporary duty travel of permanent party personnel, and is a fixed cost.

Printing is a small, fixed-cost item covering costs of printing handouts for recruiting and printing own textbook materials.

Textbook expenses are a book allowance of $75 annually for cadets under Financial Assistance Grants.

Uniforms-in-Kind covers the cost of issue-in-kind uniforms for those institutions using this system. This is a direct allocation to detachments supported by their requisitions for uniforms. It is a variable cost.

Uniform commutation covers claims submitted by each institution for eligible cadets for uniform commutation at established rates. This is a direct allocation as supported by paid vouchers for each detachment, and is a variable cost.

Supplies, equipment, and other services are fixed costs for such items of logistical support as vehicle rental, contractual services, uniform alteration and maintenance, and expendable equipment (training aids, view graphs, for example).

Indirect costs cover the total cost of operating Headquarters ROTC and a portion of the cost of the 3800th Air Base Wing and Air University Headquarters. These costs are prorated to each detachment based on cadet enrollments, and are fixed costs.

Table I-1

RESERVE OFFICER TRAINING CORPS COSTS
ROTC COST SUMMARY 1964-1968

Expense Elements	1964	1965	1966	1967	1968
Military pay	$13,431,731	$13,982,650	$13,823,874	$17,944,972	$19,201,795
Civilian pay[a]	157,588	157,903	137,200	186,638	192,847
Cadet pay	3,096,589	4,227,842	4,713,316	4,504,511	5,063,409
Financial assistance	---	---	706,004	1,444,461	2,201,892
Field training	1,020,870	1,170,396	1,544,162	1,805,145	1,968,629
Communications	---	---	---	38,986	---
Travel	---	---	---	416,384	138,971
Printing	---	---	---	112,439	86,882
Textbooks	---	---	73,350	145,200	214,130
Uniforms-in-kind	---	---	92,226	114,464	72,685
Uniforms commutation	2,891,810	2,802,960	2,092,459	2,281,590	2,088,911
Supplies[b]	263,862	279,770	274,458	114,139	392,172
Equipment	---	---	---	35,222	---
Other services	---	---	---	27,604	---
Indirect costs[c]	1,443,774	1,229,797	2,447,803	2,162,057	2,454,434
Undistributed costs	936,314	1,747,487	635,418	742,958	162,635
Total	$23,242,438	$25,598,805	$26,540,270	$32,076,770	$34,239,392
Number of graduates	3962	4506	4790	5896	5708
Av cost per graduate	$5866	$5681	$5541	$5440	$5997

[a] Prior to FY 1967, civilian pay was included in Indirect Costs. The civilian pay amounts shown for FY 1964-1966 were transferred from that account.

[b] Includes supplies and services at detachments.

[c] Includes a percentage allocation of Hq Air University, 3800th Air Base Wing, and 3825th Support Group costs and of the travel costs of the AU Surgeon's Team. In FY 1967, the cost of supplies and services at detachments was broken out into specific items. In FY 1968, supplies, equipment and other services were again combined into logistical support. The amount for logistical support for FY 1968 is listed as Supplies.

Appendix J

ALTERNATIVE DISPLAY OF ROTC COSTS

Table J-1 displays ROTC costs by Operation and Maintenance (O&M) and Reserve Personnel (RP), Appropriations (direct expenses), and Allocated Costs (indirect). The data are derived from a report prepared by Hq ROTC for use in this study, and have been adjusted (redistributed) to take into account differences between Air University accounting procedures, reflected in Table I-1, and accounting procedures used by Hq ROTC.

Table J-1

ROTC DIRECT O&M, DIRECT RPA, AND ALLOCATED COSTS, FY 1964-1968

($ thousands)

	1964	1965	1966	1967	1968
Direct O&M					
Military pay, hq & det	$14,629	$14,893	$14,433	$17,945	$19,202
Civilian pay	158	158	137	1,866	193
Financial assistance	0	0	687	1,451	2,200
Textbook allowance	0	0	74	145	214
Misc contracts	21	10	8	29	40
Travel, admin	357	365	500	521	325
Supplies	331	172	104	129	126
Other	138	134	77	175	313
	$15,634	$15,732	$16,021	$20,582	$22,612
Direct Reserve Personnel					
Cadet pay	$3,780	$5,093	$5,955	$5,858	$6,315
Uniforms	3,002	2,975	2,538	3,031	2,423
Travel	298	301	439	444	434
	$7,081	$8,370	$8,932	$9,333	$9,173
Total direct	$22,715	$24,102	$24,953	$29,915	$31,785
Allocated Costs					
AU surgeon's team (travel)	$ 0[a]	$ 53	$ 52	$ 51	$ 50
3825th support group	0	60	76	161	139
Hq Air University	60	856	858	1,094	1,004
3800th ABW	468	527[b]	601	1,148	968
	$ 528	$ 1,497	$ 1,587	$ 2,162[c]	$ 2,454[c]
Grand total	$23,242	$25,599	$26,540	$32,077	$34,239

[a]Surgeon Team travel costs ($56,458) in 1964 were treated as a direct expense and charged to administrative travel.

[b]Prior to FY 1965, the allocation of Air University costs was based on permanent party personnel only; detachment personnel were included thereafter.

[c]Totals are actual. Distribution among the four cost sources is approximate.

Appendix K

ROTC ADJUSTED COSTS--FISCAL YEARS 1964-1968

Table K-1

ROTC COMPUTED COSTS ADJUSTED TO FY 1968 DOLLARS[a]

Expense Elements	FY 1964	FY 1965	FY 1966	FY 1967	FY 1968
Military pay	$13,150,956	$16,133,820	$15,939,935	$18,371,460	$18,677,196
Adjustment factor	x 1.61314	x 1.32439	x 1.247763	x 1.05366	x 1.000
	21,214,333	21,367,470	19,887,131	19,257,273	18,677,196
Civilian pay	157,588	157,903	137,200	137,638	192,847
Adjustment factor	1.1611	1.0941	1.0231	1.0231	1.000
	182,970	172,762	145,720	190,949	192,842
Cadet pay	5,398,895	5,721,762	5,571,278	5,735,546	5,026,787
Financial Asst Grants			706,004	1,444,461	2,201,892
Adjustment factor			1.0438	1.0248	1.000
			736,927	1,480,284	2,201,892
Field training	1,020,870	1,170,396	1,544,162	1,805,145	1,968,629
Cadet pay	(683,898)	(865,460)	(1,241,834)	(1,353,106)	(1,252,087)
Adjustment factor	1.38471	1.32019	1.08952	1.05532	1.000
	926,483	1,142,572	1,353,003	1,427,960	1,252,087
Non-Personnel	(336,972)	(304,936)	(302,328)	(452,039)	(716,452)
Adjustment factor	1.0808	1.0628	1.0438	1.0248	1.000
	364,199	324,086	315,570	463,250	716,542
Total field training	1,290,682	1,466,658	1,668,573	1,891,210	1,968,629
Communications				38,986	
Adjustment factor				1.0248	
				39,861	
Travel	300,575	365,351	500,328	521,416	324,571
Adjustment factor	1.0808	1.0628	1.0438	1.0248	1.000
	324,861	388,295	522,242	534,347	324,571
Printing				112,439	86,882
Adjustment factor				1.0248	1.000
				115,227	86,882
Textbooks			73,350	145,200	214,130
Adjustment factor			1.0438	1.0248	1.000
			76,563	148,801	214,130
Uniforms	2,891,810	2,802,960	2,184,685	2,396,054	2,161,596
Adjustment factor	1.0808	1.0628	1.0438	1.0248	1.000
	3,125,468	2,978,986	2,280,346	2,455,476	2,161,596
Supplies	263,862	279,770	274,458	114,139	392,172
Adjustment factor	1.0808	1.0628	1.0438	1.0248	1.000
	285,182	297,340	286,479	116,939	392,172
Equipment				35,222	
Adjustment factor				1.0248	
				36,096	
Other services				27,604	
Adjustment factor				1.0248	
				28,296	
Allocated costs	1,337,689	1,496,673	1,586,893	2,162,057	2,454,434
Adjustment factor	1.0808	1.0628	1.0438	1.0248	1.000
	1,445,774	1,590,664	1,656,399	2,215,676	2,454,434
Undistributed costs			639,526		
Adjustment factor			1.0438		
			667,537		
GRAND TOTAL	$33,268,165	$33,983,937	$33,499,206	$34,345,962	$33,701,131

[a]See Appendix E for listing and explanation of adjustment factors.

Appendix L

ROTC FLIGHT INSTRUCTION PROGRAM (FIP)

Table I-1

ROTC FIP COMPLETIONS AND COSTS

	FY 1964	FY 1965	FY 1966	FY 1967	FY 1968	Totals
Number participating[a]	1813	2067	1888	1830	1654	9252
Number completing	1561	1717	1616	1541	1462	7897
Percent of noncompletions	13.899	16.932	14.406	15.792	11.607	14.645
Number Eliminated						
Inaptitude	40	55	66	59	56	276
Self-initiated	77	72	47	48	31	275
Medical	18	37	20	27	49	151
Other	69	98	71	108	28	374
Total eliminated	204	262	204	242	164	1076
Number Waived						
Valid private pilot's license	9	39	34	45	49	176
Hardship with flying	31	42	28	24	13	138
Hardship without flying	17	23	40	50	64	194
Total waived	57	104	102	119	126	508
Total costs of FIP	$905,617	1,011,089	969,783	978,211	936,606	
Adjusted for COL	978,791	1,074,585	1,012,259	1,002,471		
Cost per successful completion	580.15	588.87	600.11	634.79	640.63	
Adjusted for COL	627.03	625.85	625.40	650.53	640.63	

SOURCE: Hq ROTC Report on Progress of Flight Instruction Program, Authorized by PL 88-647, dated Oct. 13, 1964 (as of January of each year).

[a]Number participating does not reconcile with number completing plus number eliminated plus number waived. For example, number participating does not include number waived for possessing a valid private license and number waived for hardship without flying. Also complicating the balance is number of carryovers from previous year.

Appendix M

OFFICER TRAINING SCHOOL COURSE COSTS

Table M-1

OTS COSTS PER STUDENT-WEEK

	FY 1964	FY 1965	FY 1966	FY 1967	FY 1968
Student-Weeks	60,839	40,993	36,439	88,232	82,067
Direct Costs					
Military staff pay	$28.93	$39.85	$37.37	$26.80	$35.10
Civilian staff pay	2.43	3.72	4.54	2.48	3.58
Material procured locally	.52	.81	.63	1.32	.01
Material procured centrally	.64	.27	.05	---	.68
Other costs	.16	.44	.75	.34	.65
Total direct costs	$32.68	$45.09	$43.34	$30.94	$40.02
Indirect Costs					
Military staff pay	19.94	26.70	20.71	26.57	26.52
Civilian staff pay	11.13	14.42	11.68	15.30	13.87
Subsistence	6.45				
Materiel procured					
Locally	4.56	6.70	5.30	5.29	2.56
Centrally	.43	.81	.11	.60	4.10
Other indirect costs	4.22	4.49	4.82	4.42	1.29
Total ind costs	46.73	53.12	42.62	52.18	48.34
Command Overhead	3.56	3.61	2.52	3.23	4.69
Student Pay and Allowances (Staff Sgt)	87.56	102.92	102.92	127.65	140.83
Total Cost/Student-wk	170.53	204.74	191.40	214.00	233.88
Attrition (%)	8	11	11	12.6	10
Adjusted for attrit.	1.043	1.062	1.062	1.072	1.056
Cost/student-wk ($)	177.86	222.14	202.27	229.41	246.98
Course length in wks	x 12	x 12	x 12	x 10.8	x 12
Cost Per Graduate	2,134	2,666	2,439	2,478	2,964
Accession Costs					
PCS to UPT	300	389	311	509	509
Initial clothing	200	200	200	200	200
Clothing issue	235	235	235	221	221
Pro rata recruiting	175	184	151	178	178
Cost Per Pilot Cand.	$3,044	$3,674	$3,336	$3,536	$4,07?

SOURCE: ATC C-107 Report.

Appendix N

OTS COSTS ADJUSTED TO FY 1968 DOLLAR EQUIVALENTS

The FY 1964-1967 costs were adjusted to FY 1968 dollar equivalents by means of the adjustment factors shown in Appendix E. The adjusted data are shown in Table N-1. The cost elements and ground rules for costing are explained below.

DIRECT COSTS

Direct costs are developed by identifying and assigning OTS mission costs to standard accounts established by AFR 172-7. In addition to costs, the school administration reports total student weeks each month. The total student strength in training at OTS on a designated day during each calendar week constitutes the student weeks realized. The training week runs from Wednesday through Tuesday of the following week. In other words, total student weeks represent the in-training strength of OTS courses in progress as of Wednesday of each week. At the end of the reporting period, OTS reports the course number and title, duration of the course in calendar weeks, the attrition rate, and the average grade of students, which is Staff Sergeant. Elements of direct cost are divided by number of student weeks to obtain a cost-per-student week. Elements of direct cost include the following:

Military Staff Pay. Military pay of OTS permanent party officers and airmen are averages of all elements of pay and allowance costs included in the Military Appropriation. Cost elements included in the factor and the dollar costs per officer and per airman are reported in AFM 172-3, USAF Cost and Planning Factors, which is amended from time to time. Military staff pay is obtained by multiplying the number of officers and airmen by their respective pay factor published in AFM 172-3.

Civilian Staff Pay. The pay and allowances of OTS civilians are based on the actual costs of civilian pay at Lackland AFB.

Supplies and Material. These costs are broken down between local purchase and centrally procured items.

Other Costs. Other costs include miscellaneous items of cost.

The cost per student-week for each of the four elements of direct cost are totalled into one direct cost per student-week.

INDIRECT COSTS

Indirect costs include base costs, such as materiel maintenance, installations maintenance, base services, management, and medical support, not considered direct training costs. Elements of indirect cost are military staff pay, civilian staff pay, supplies and materiel broken down into local procurement and central procurement, and other costs. Each element is prorated to OTS on a student-week basis and totalled into one indirect cost per student-week.

COMMAND OVERHEAD COSTS

Air Training Command overhead costs are distributed to Lackland AFB based on the ratio of total permanent party personnel (military and civilian) at Lackland to the overall permanent party personnel of ATC (excluding ATC Headquarters personnel). Command overhead costs are converted into cost per student-week by dividing the total number of student-weeks of training for all courses conducted at Lackland AFB into Command overhead costs.

EXCLUDED COSTS

Both direct and indirect training costs exclude certain items that are not chargeable to the training mission, such as pay of personnel in confinement, intra-command PCS costs, cost of services sold, factory training, field and mobile training detachment costs, costs of nonresident training functions, maintenance of tenant and transient aircraft, support furnished tenants and special activities not assigned to support the training mission, and that portion of Air Force hospital expenses supporting area medical facilities. For example, Wilford Hall USAF Hospital support for Lackland AFB is 47 percent of total hospital activity.

STUDENT PAY AND ALLOWANCES

To direct, indirect, and command overhead costs is added the standard rate for the weighted average grade of students attending OTS (Staff Sergeant) for one week as taken from a chart of weekly pay rates for different grades published by OSD. The total of the four components gives the total cost per student-week.

COURSE LENGTH ADJUSTED FOR ATTRITION

The average cost per student-week is based on actual weeks experienced, including student weeks for students who did not complete the OTS course. To derive cost per graduate, the actual course length of OTS (12 weeks) has been multiplied by a factor which represents the attrition rate. In the case of a 12 percent attrition rate, this factor is 1.068. The derivation of the factor is based on the assumption that attrition occurs midway through the course. To illustrate, assume there are 1000 graduates. With a 12 percent attrition, 1136 trainees were entered in OTS to produce 1000 graduates. The 1136 trainees consumed 6816 student-weeks (i.e., 6 x 1136 = 6816) before 136 were attrited. The 1000 trainees remaining after attrition consumed 6000 student-weeks during the last half of the course. Thus, 12,816 student-weeks were consumed in order to produce 1000 graduates. Each graduate cost 12.816 weeks of training instead of 12 weeks. The factor represents the ratio between the cost in weeks of training versus the cost if no attrition had occurred (i.e., 12.816/12 = 1.068).

OTS COURSE COSTS ADJUSTED FOR PAY RAISES

Pay and allowances of military and civilian personnel constitute over 90 percent of OTS costs, e.g., $219.90 of the $233.88 total cost per student-week in FY 1968. The pay raises and accounting adjustments that have occurred in the past few years distort the costs to the point that cost estimates derived from the unadjusted data in Appendix K give a reverse projection--the higher the volume of production, the higher the cost per graduate.

Appendix N

Table N-1

OTS COSTS ADJUSTED TO FY 1968 DOLLARS[a]

	1964	1965	1966	1967	1968
Student Weeks	60,839	40,993	36,439	88,232	82,067
	Costs Per Student-Week				
Direct Costs					
Military staff pay	43.83	53.99	45.53	27.65	35.10
(FY cost factor)	(1.5149)	(1.3549)	(1.2719)	(1.0319)	
Civilian staff pay	2.82	4.07	4.82	2.54	3.58
(FY cost x factor)	(1.1611)	(1.0941)	(1.0621)	(1.0231)	
Mat'l & other costs	1.43	1.62	1.49	1.70	
(FY cost x factor)	(1.0808)	(1.0628)	(1.0438)	(1.0248)	
Total	48.08	59.68	53.84	31.89	40.02
Indirect Costs					
Military staff pay	30.21	36.18	26.34	27.23	26.52
(FY cost x factor	(1.5149)	(1.3549)	(1.2719)	(1.0319)	
Civilian staff pay	12.92	15.78	12.41	15.65	13.87
(FY cost x factor)	(1.1611)	(1.0941)	(1.0621)	(1.0231)	
Mat'l & other costs	16.93	12.75	10.78	10.57	8.95
(FY cost x factor)	(1.0808)	(1.0628)	(1.0438)	(1.0248)	
Total	60.06	64.71	49.53	53.45	48.34
Command Overhead (unadj)	3.56	3.61	2.52	3.23	4.69
Student pay & allowances	140.83	140.83	140.83	140.83	
	252.53	268.83	246.72	229.40	233.88
Total Cost/student-wk					
Attrition (%)	8	11	11	12.6	10
Adjusted for attrn	1.043	1.062	1.062	1.072	1.056
Cost/student-wk	263.39	285.50	262.02	245.92	246.98
(Course length in wks)	x 12	x 12	x 12	x 12	x 12
Cost per graduate	3,161	3,426	3,144	2,656	2,964
Accession Costs (FY 68)					
PCS to UPT	509	509	509	509	509
Initial clothing	200	200	200	200	200
Clothing issue	221	221	221	221	221
Pro rata recruiting	178	178	178	178	178
Cost/pilot candidate	4,269	4,534	4,252	3,764	4,072
No. of pilot candidates	454	440	1,082	1,393	1,921
Program costs for pilot candidates (rounded)[b]	$1,938	$1,995	$4,601	$5,243	$7,822

[a] See Appendix E for adjustment factors.

[b] In thousands of FY 1968 dollars.